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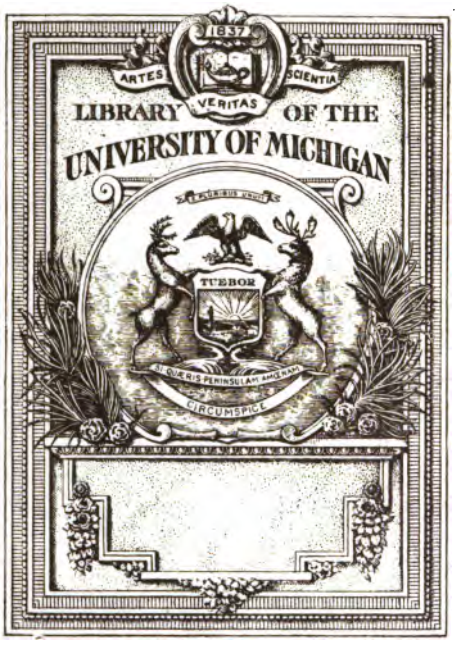
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THE MUSEUM

CURTAINING OF WINDOWS, AND CHAIRS FOR PUBLIC. OPERA DEL DUOMO, FLORENCE, ITALY

THE MUSEUM

A Manual of [illegible] Housing and Care of [illegible]

BY

MARGARET TALBOT JACKSON

LONGMANS, GREEN AND CO.
FOURTH AVENUE & 30TH STREET, NEW YORK
39 PATERNOSTER ROW, LONDON
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PREFACE

THE object of this little book is to put before those interested in the administration of collections the result of several years of study of the museums of Europe and America. It cannot claim the distinction of bringing new ideas to a field where so many men of genius have long been working; it can only hope to call attention to the results of the constant experiments being made by those already in the field.

The author is under deep obligations to the many museum directors who have generously given their counsel and the results of their experience. Especial thanks are due to Professor Adolfo Venturi, Dr. J. B. Carter and the American Academy in Rome, His Excellency Dr. Bode, Dr. Karl Koetschau, Dr. Camille Enlart and Dr. Edward Robinson.

CAMBRIDGE, January, 1917.

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THE MUSEUM

THE MUSEUM

CHAPTER I

The Situation of the Museum Building

THE first problem to be considered by a Board of Trustees about to found a new museum is the choice of the location. Sometimes this is already decided for them: a gift of land is made and it is necessary for the building to be placed upon that land. If, however, the trustees are free to make their own choice, what are the questions that should be answered before a lot can be considered desirable? The first of these is whether a museum should be regarded as an institution for the education of the masses, or whether it should serve as a centre for study for specialists, or both.

Here in America a museum is regarded as a part of the educational system, and the great contribution that we have made to the development of museum science has been the addition to the duties of the museum official of the important

work of teaching Art, not only to those who know they are interested, but to the school children and others who may be induced to take an interest. If, then, the museum is to fulfil its greatest function, in bringing its treasures into the lives of all the people, the first and most important consideration in choosing a site is, how easily will it be accessible to the majority of people who will visit the museum? In certain unfortunate cases it has been deemed wise or expedient to choose a position far from the centre. Let us consider, for a moment, the Boston Museum. When the old building in Copley Square was put up, a plot of ground considered sufficient for an indefinite growth was bought. With streets on either side and in front, it was hoped that the museum would be safe. With the rapid growth of the city the situation became more and more intolerable. It was accessible; yes, too accessible. The street cars, which passed the front door, and the trains, which stopped at the station almost immediately behind the Museum, brought not only vibration, but dust, which it was impossible to combat. Then, again, the changing character of Copley Square made the danger from fire such that the situation was no longer considered safe. Land values in the meantime had increased so much that by selling their holdings in that place and buying in a less

expensive locality the Trustees were able to control a much larger area. Thus there were many extenuating circumstances which excused the move to the Fenway, but in spite of the new building, the increased facilities, and the interest already aroused among the people, the attendance fell off to such an extent that it was deemed necessary to offer, for a time, inducements to visitors. On certain days special through cars were run from different parts of the city to bring to the new site people who had formerly been able easily to reach the Museum.

In New York the situation chosen for the Metropolitan Museum was at a great distance from the centre, but such are the peculiar conditions in that city that growth must be in the direction of the Museum and not from it. The question of communication is here even more complicated than in Boston, and yet the very fact that there will undoubtedly never be a street-car line going directly past the Museum is in itself an advantage, because the dangers from vibration are thus removed. With the millions of inhabitants and visitors in New York the Metropolitan can register a large attendance though it is not accessible, but this is not true in smaller cities, and the question of how far it is right to sacrifice safety in order to put the building where it can most easily be reached by

the people is a very serious one. In Chicago, on the other hand, the Art Institute is located in the centre of the down-town district and while it is most unfortunately placed in relation to the railroad which passes the rear, it is at the same time so accessible that the number of its visitors is extraordinary.

Let us consider for a moment the European museums from this aspect. In Berlin, where there is a large group of Art museums, all the more important ones, with one exception, are grouped on the so-called Museum Island, in the heart of the city. The street cars and railroads pass so close to the museums that the dust and vibration which they cause are serious. In Paris, the chief collections have been brought together in the old royal palace of the Louvre, situated in the heart of the city, and although street cars pass along one side the traffic is not so heavy as to cause vibration, though there is much noise and dust. Accessibility is assured by the innumerable lines of motor buses which pass the museum on all sides, as well as by the underground, which has a special stop at that point. In London the case is somewhat different. There, although the British Museum is in the heart of the city, there are no street-car lines which come nearer to it than one block away. The enormous number of people who visit this museum

may be compared with some interest with the comparatively small number of those who visit the South Kensington Museum, which containing, as it does, collections of decorative arts, should have an equal popular appeal with the archæological and scientific material in the British Museum. This is just a case to illustrate the point. The people will go to the museum that they can reach with the least effort, irrespective of what it contains. From all these examples it will be seen that the ideal situation for a museum building is in a central location one block away from street-car lines and several blocks removed from the railroad. A strong argument in favor of centralization of museums has been presented by J. C. Dana in his article on the Gloom of Museums in the Newarker for October, 1913, page 396.

Another important consideration is the cost of the land. If the museum is to be in the heart of the city the site will cost more in proportion to its size. With the rapid development of our American cities it is quite impossible for any one to forecast the direction of the growth, but care should be taken to choose a site which in all probability will not decrease in value, as circumstances might arise which would make it necessary for the museum to move and for this reason to desire to sell its former site.

The ownership of neighboring lots is another vital question. The erection of a factory near the museum may be a dangerous menace to the safety of its contents. Smoke, soot and dust are among the greatest dangers we have to face in the preservation of works of art. A large department store or even an office building as a neighbor cannot fail to bring some fire danger. Unfortunately it has not yet been possible to find a means of rendering our buildings thoroughly fire-proof. Even with all modern devices the risk is great, and there is hardly a building that would not prove a serious menace to its neighbors should a fire once gain headway. If a museum building is to be placed in the heart of the city, therefore, there must be not only the usual provision for a legitimate growth, but some surplus to guard against undesirable neighbors.

As regards growth, it is to be hoped that the museums of the future are going to be very different from the museums of the past, and that we shall learn that economy in running a large plant is not the only consideration. Such monstrosities as the Louvre in Paris, the South Kensington in London, and the Metropolitan in New York, will no longer be possible, but their place will be taken by museums of moderate size, devoted not to all art from earliest times to the present day,

but to different periods or classes of material, and we shall then have museums dotted about in the different quarters of the city where they will reach a larger number of people and where one can spend, in intimate association with a series of objects, a number of hours without that overwhelming sense of fatigue that comes to the weary visitor who knows that although he is now in gallery number 22, there are fifty-seven that he has not seen, and through which he possibly may have to pass before emerging from the building. It is very much more interesting to go to ten different places than it is to go to the same place ten times.

One other matter should be considered in choosing a lot, and that is the quality of the ground. As a concrete example let us see what happened in Berlin. So many mistakes have probably never been made elsewhere in this respect, and yet, Germany has at this present time developed museum work to the position of an exact science. It seems as though in these days it would hardly be possible anywhere for a piece of ground situated at the end of an island, between two streams which are constantly used by canal boats, to be chosen as the site for a museum, especially a museum of such importance as the Kaiser Friedrich. In the first place the ground is not capable of supporting so large a structure, and the expense of building

piers is almost as great as it would be were the building located in mid-stream. Again, the smoke from the engines of the canal boats makes on some days so dense a cloud that the windows of the museum are darkened by it, while the presence of the water elicits the complaint from the engineer in charge of the ventilating apparatus that he is unable adequately to control the humidity because of the amount of water in the immediate vicinity of the museum! But this is not the worst evil. Permission was granted to build, directly behind the museum, the elevated tracks which were to carry express trains from Petrograd to Paris through the city instead of around it. On these same tracks run suburban trains at frequent intervals. This means that several times a day enormously heavy trains with many cars go jolting by, and every five minutes a suburban train, puffing volumes of smoke, pants on its way. The vibration from this road has caused such cracks in the walls of the museum that in a desperate effort to remedy matters many thousands of dollars were spent in digging a trench ten metres deep and ten metres broad. In this trench concrete retaining walls were built and the middle space was filled with rough stone loosely put in to interrupt the vibratory waves. One would have thought that when everyone recognized that such a mistake had

been made in the case of this museum that in Berlin, at least, no other museum would be subjected to a similar fate. Unfortunately, however, an old decree made by the grandfather of the present Emperor called for the building of all museums on the so-called Museum Island. When, therefore, money was given for the building of the new German, Oriental and Pergamon Museums, there was no question in the mind of any one where they would be placed. The expense of building the foundations in the soft soil was cheerfully met and, though it seemed a criminal waste to put so much money below ground, all would have been well had they not stumbled upon a place where, in spite of boring to great depths, they were unable to find solid bottom. This proved to be a glacial pocket, small on top and broad beneath, which had to be cleared out and filled in before the work could proceed. In the process of excavating, so much water had to be pumped out that the neighboring Neues Museum began to show signs of weakness. For about twenty-four hours it was in imminent danger of collapse and only immediate stoppage of all work and great precautions to relieve the strain prevented the subsidence of the whole building. After wasting two years of time and about a half-million dollars on this one bad place in the earth, the hole was filled up with con-

crete to a depth of sixty metres, or more than one hundred and eighty feet. That the extent of the damage wrought in the Neues Museum is not yet known we may be sure. The building is erected on wooden piles which have stood in water until this unfortunate affair necessitated the pumping out of the ground water from that vicinity. How much damage had the air done to those piles before the water was allowed to flow back again? This is the question that is now occupying the engineers.

To sum up: in selecting the site for a new museum building the following matters must be considered. First, the situation should be as near the civic centre as possible or at least thoroughly accessible from all parts of the city. Second, if outside the centre, it should be on the side of probable future development. Third, the lot must be large enough to allow for growth as well as to protect the museum from undesirable neighbors. Fourth, it must be of such a character that the expense of building foundations and the maintenance costs when built will not be excessive.

CHAPTER II

The Architectural Plan

UNTIL our American Trustees realize that the architect is not an omniscient being, blunders are going to be made in our museums. So far, few architects have specialized in museum buildings and the subject is so vast that it cannot be mastered offhand. It is the part of the museum specialist, the director, to guide the architect in the development of the plans. American museums are at a disadvantage because the exact line of their growth cannot be forecasted, but the only way by which a museum can be thoroughly consistent and adapted to its uses, is by having an understanding first of exactly what those uses are to be! To meet this difficulty the Director should study the conditions, and consult with the Trustees in regard to the possibilities in the city in which the museum is located. Therefore, the first step in planning a new museum is not to open a competition for the design of the building, but to choose a Director. Who the architect is, matters very little after that, provided both he and the Director understand their

business. The Historical Museum in Hamburg has recently begun a new building on the plans of which the Director and architect had worked for three consecutive years before a single stone was laid. The consequence is, that the plan is as nearly perfect as one can hope to find in this present day. Whether in this country we should have the patience to spend three years on plans or not is a question, but time should be allowed for the Director and building committee to see that the plan is complete in all its details and to make changes and revisions.

Turning now to a consideration of the separate points, we find that the exterior may safely be left to the architect, but only after the interior has been carefully planned out. In the building of the Rautenstrauch-Joerst Museum in Cologne [Foy, Dr. W., Ethnologia, Städtischen Rautenstrauch-Joerst Museum, Cöln; Leipzig, 1909. Museums Journal, vol. VI, p. 408, discussion of Dr. A. B. Meyers' paper on Museum Cases] the type of cases which would best display the objects was first considered, then the kind of light and size of room that would be most effective, and finally the exterior which would fit this interior. It matters little what style is adopted, provided that it does not interfere with the needs of the interior. The material of which the museum is

built will depend largely on the amount of money at the disposal of the committee, but it must always be borne in mind that a third must be added to the contractor's price to cover possible changes and mistakes in estimates, and that the cost of proper installation is very high. It would be perfectly possible to build a museum of concrete or brick that would be better adapted to the collections than the usual marble structure and the saving in expense would be sufficient to insure adequate equipment for carrying on the work of the institution. This is a point too often neglected. Having spent several hundred thousand dollars on the shell, the Trustees find themselves unable to provide funds for the expensive installation which is needed by most art objects.

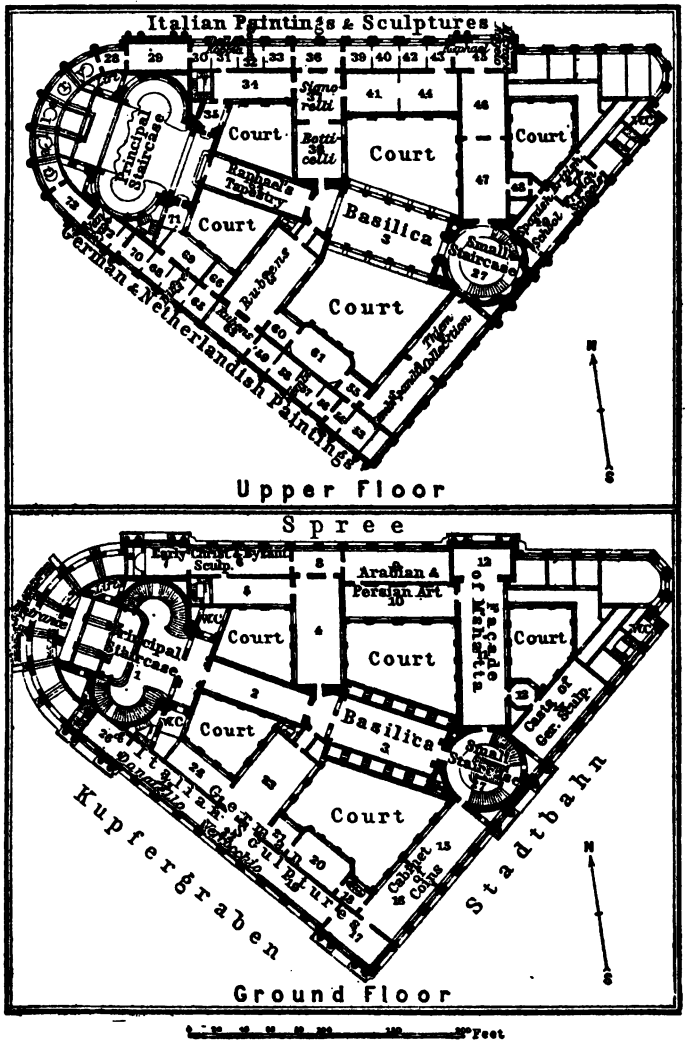
The museum Director working with the architect must consider the following points:

ENTRANCES

In general it may be said that the fewer the public entrances the better, in order to control both the number of people who go in and the number of people who go out of the museum. Two or more entrances have proved rather confusing, especially where umbrellas, walking sticks, etc., are checked at one entrance and the visitor leaves by another. Museum attendants complain of hav-

ing umbrellas left from one rainstorm to the next by people who have entirely forgotten that they had an umbrella with them on entering the building. This, of course, is rather a minor matter, but the facility in controlling the exit in case of a theft is much greater where there is but one entrance. Every additional public entrance also increases the cost of service. This does not mean, however, that there should not be other entrances in the building. Indeed, a most important and often forgotten detail is the provision for the entrance into the museum of large objects of art. Many an architect seems to feel that objects grow in the museum and that it is not necessary to provide a special door for them to come in. Not only should there be some entrance, but that entrance should be large enough to admit even a crated statue of heroic size. Moreover, it should be arranged with a driveway and an unloading platform at the height of the ordinary truck and preferably also on a level with the floor of the receiving room. It is very necessary that where there is a lecture room in the museum there should be a special entrance which will admit people who go to the lecture without obliging them to pass through the exhibition rooms. There is no doubt that the public gains something from passing through exhibition galleries in this way, and where the museum

EMPEROR FREDERICK MUSEUM



is small and arranged for this contingency it may be permissible to expect to make one entrance serve both museum and lecture room. It must be borne in mind, however, that there are many occasions when it is advisable to use the lecture room at night, and if a separate entrance is provided, even if it is not always used, it is possible to do this without the expense of lighting and guarding the whole museum. A fourth entrance, which may have some connection with the last mentioned, should give access to the rooms of the staff. It should never be necessary for objects which are brought for the staff to examine to pass through the exhibition rooms. Even with every precaution in the way of checks it might be possible for a worthless object to be taken out of a checked bundle and some interesting and easily portable museum piece substituted. Again, on pay days, or when the museum is closed to the public, if there is no separate entrance to the rooms of the staff, it is necessary to admit free every person who says he wishes to speak to the Director, and then to provide him with an escort to see that he does not wander about the museum unattended. On the other hand, it does not do for the office of the staff to be accessible only to the public. It must be possible to have direct access to the galleries and exhibition halls. This can usually be ar-

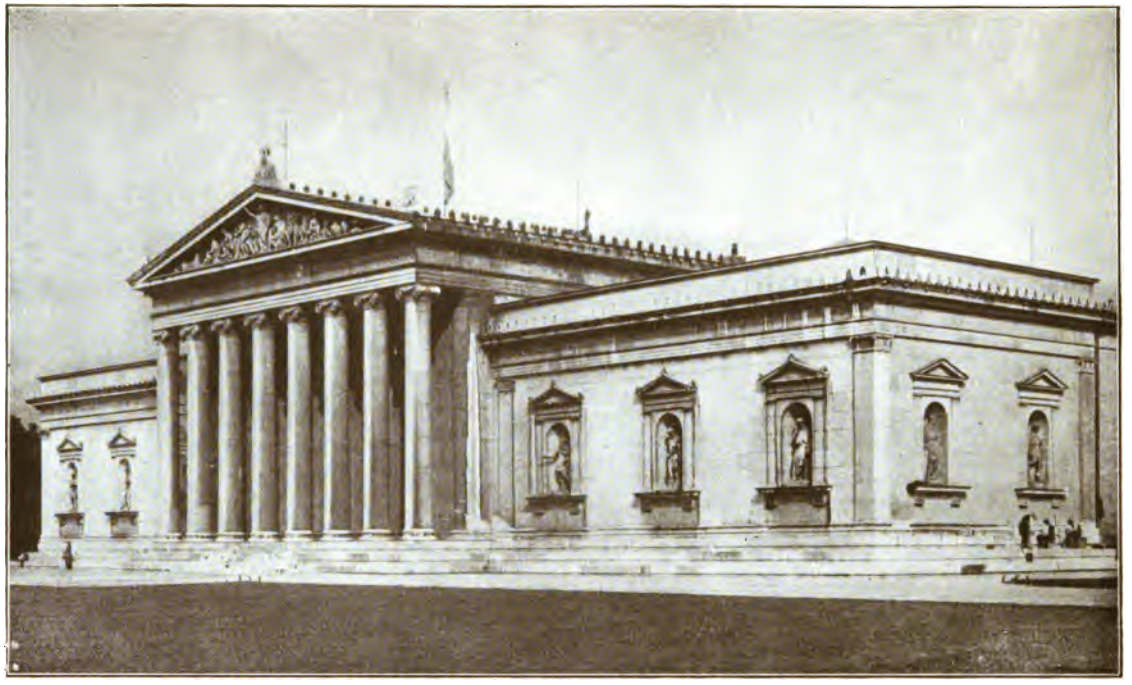
ranged by placing the offices near the front door in such a way that a door leading from the vestibule gives direct access into one of the offices. The rooms then open, one into another, with possibly a private corridor, and this in turn opens into the museum. When the new museum buildings in Berlin are completed, the plan of the Kaiser Friedrich Museum will be much more rational in this respect. At present the only entrance is from the west and all the offices of the staff are in the east end of the building. Later it is planned to make accessible the doorway in the east end, which at present is blocked by the construction of the new building. Thus it will not be necessary for the public to pass through the museum, although it would be more convenient to do so. The National Museum in Munich has a large tower at the entrance and from the vestibule a special staircase leads to the Director's rooms. In this tower also are the library and a smoking room for the use of the staff. The grand staircase separates this tower from the main building. In this way the danger of fire, incident to the work of an office is removed from the museum building, and yet there is a ready means of access from each of the offices into all parts of the building.

If the plans for the new Historical Museum

in Hamburg are ever carried out, the Director's offices there will be the best placed of any museum visited. The arrangement provides for a vestibule from which the public enters directly into the main corridor of the museum. To the left of the vestibule a door leads to the Director's offices and to the right to the lecture hall. Thus it is possible for visitors to be admitted at once to the presence of the Director and to leave again without even entering the main corridor of the building, at the same time using only one front door. The staff, on the other hand, can go from their office into the museum by going out another door which opens into the main corridor.

STAIRCASES

Many mistakes are made in providing monumental staircases. This is undoubtedly due to the fact that our American museums have been copied more or less from European museums, and European museums have been largely adaptations of palaces for museum purposes. Thus, for instance, few buildings have more grand staircases than the Louvre, but that is because the Louvre was a royal palace and grand staircases were intimately connected with the needs of court life. There is an opportunity for the ambitious architect in the wonderful chance to produce an imposing archi-



A MUSEUM ALL ON ONE FLOOR, THE GLYPTOTHEK, MUNICH, GERMANY

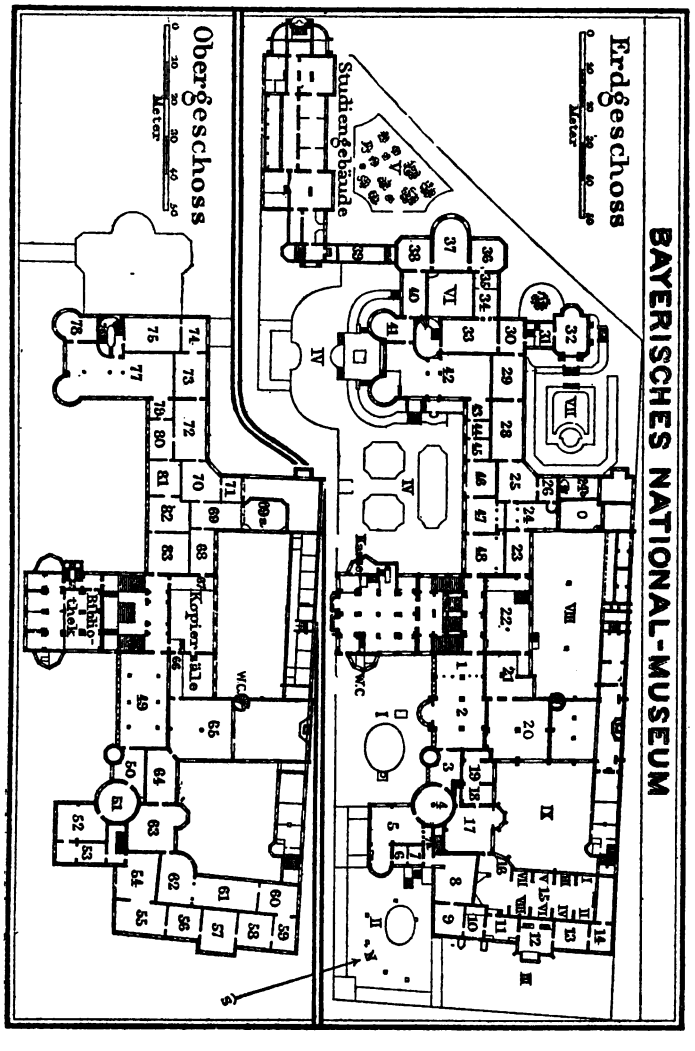
tectural feature in these staircases. One of the worst examples of this fault is in the Kaiser Friedrich Museum in Berlin. As we have said elsewhere, the museum is so situated that it can never grow. Under the circumstances one would expect every available inch of space to be used for exhibition purposes, but, alas, two enormous staircases, one at either end of the building, absorb much useful exhibition space. Had the architect been willing to do without the huge structure in the front of the building he would have gained a large amount of space. The large staircase at the back of the building would have been quite sufficient for all ordinary purposes, especially when it is remembered that there are in addition three service staircases, any one of them large enough to amply take care of a good-sized crowd in case of fire or other danger. Two elevators add to the means of access from one floor to another. (See plan, page 17.) Many officials are looking toward the future for a type of museum building all on one floor, which shall be without stairs (cf. the Glyptothek, Munich). There is nothing more discouraging to the would-be museum visitor than to arrive inside the door and find himself confronted by a seemingly interminable flight of stairs which must be mounted before he attains his object. In the Boston Museum, for instance, the collections on

the ground floor are for study and the visitor who wishes to see the exhibition collections must climb a flight of glaring white steps. How much better it would be to have an attractive vista of exhibition rooms opening out from the entrance hall and to hide the stairs somewhere in the ends of the wings where they need not be either costly or very large. By providing an elevator for the public and staircases six or eight feet wide, it would be possible to take care of even a rather large crowd. [In this connection let it be noted that there is an art in building stairs of the right proportion. The measure of the rise and tread of the stairs in the Institute of Arts, Minneapolis, is the most perfect so far as the author's experience goes.] Except for the one large staircase opposite the main entrance in the Metropolitan Museum, the wings are provided with staircases of normal size which are neither costly to build nor tiresome in appearance. Aside from all this the heating of a building which has huge stairways is always difficult. Elevators for the public are expensive. There must be licensed operators constantly in attendance and liability insurance must be carried. But if such an elevator is not provided there must be some means of taking lame persons or invalids over the stairs, in freight elevators if necessary.

CORRIDORS

There is hardly a more pernicious fault in a museum building than the provision of corridors which are so wide that it seems a waste not to use them for exhibition purposes and yet which are so narrow that any exhibits crowd oppressively upon the visitor. In this respect the plan of the Bavarian National Museum in Munich is excellent. Here one passes from room to room without the intervention of corridors, and the temptation to go on and see just a little more is enhanced by the variety in the shape of the rooms and by the material displayed. On the other hand nothing is so wearisome as the long gallery in the Louvre, where one passes some of the most remarkable paintings the world has ever known but is too wearied by the oppression of their nearness and the interminable length of the space that must be covered to be able to enjoy them. Again, take for example the long galleries in the Vatican. Who is there who has ever visited them that does not recall the words of Hare, who describes the Galleria Lapidaria as being 2131 feet long? Corridors should provide the possibility of getting from one part of the building to another without traversing a long series of rooms. The plan of the Kaiser Friedrich Museum in Berlin, which we

have seen to be so poor in some respects, is in this respect remarkably good. A central axis is formed by the small exhibition gallery on the ground floor and by the great basilica, and this in turn is connected with the side rooms by two transitional galleries, large enough to make interesting exhibition units, and so placed that the material they contain may be related to that at either one side or the other. Again, at the back of the building, two more large galleries give access to the rooms on either side. In this manner it is possible to pass very rapidly from the entrance to any part of the museum without going through a large number of rooms unnecessarily. All space is valuable for exhibition and the corridors must take their place with the other rooms. As they are difficult units to arrange they should be subordinated where possible, and especial care must be taken that a corridor outside a gallery does not prove a disagreeable feature on account of cross light which enters through the doorways. A gallery may have the function of a corridor and is much more easily arranged and cared for than a regular hallway. Objection has been raised that in the museum without corridors people pass rapidly through room after room without stopping to look at the objects in the room. It is not possible for any one to pass through a room in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Kopierstelle
Bibliothek

this way without gaining something. The objection that passers-by interfere with those who wish to remain and look at the objects is hardly valid. If the visitor can be so easily disturbed he will gain little from his visit. On the other hand, corridors make a museum doubly hard to guard. Where one room opens into another, half as many guards are necessary as where each room opens only into a corridor, for if it is possible for a man to stand in one room and see into one or two other rooms he can do his duty much better than where he has to go to the door of a room in order to see what is happening within it. Some sort of access must be provided, but the clever architect will carefully study the problem of corridor space.

GALLERIES

The tendency nowadays is to provide a series of exhibition rooms where only the finest objects are displayed and a second series of study rooms, where the reserve collection is kept. Long experience, especially with archæological material, has led Museum Directors to feel that a quantity of specimens illustrating any one class of objects failed to interest the public and that it is only by making a selection that they are able to appeal to the general visitor. It is often hard to draw the line between material which is important his-

torically, and which the public should be induced to appreciate, and material which has no value except to the special student, particularly as it is usually the special student who is put in charge of the material. If one is to make a distinction, perhaps the easiest way to do it is by choosing for the public collections only material which has some artistic importance and leaving in the study series the replicas or less perfect specimens. With certain types of objects, as for instance, textiles, a changing exhibition is much to be preferred to the customary showing of all the pieces. This can easily be arranged and will take less space than if all pieces are exhibited. (See Chapter V.)

Starting then with this hypothesis, what are the rules in regard to proportion of rooms that must be considered? This is perhaps the most difficult point of all. No architect has yet succeeded in laying down rules which would always apply in regard to proportion, and much depends upon the material to be displayed in the rooms. Thus, for instance, rooms in which objects of various classes are displayed together according to period must partake somewhat of the general character of the century they represent. Should a museum be fortunate enough to possess actual interiors, special arrangement must, of course, be made for showing them. (cf. Zürich, Landes-

museum; Stockholm, Northern Museum, and many others.) Galleries for sculpture require greater height than galleries for pictures. Where one is working with a collection already established it is much simpler to decide upon the necessary proportions of the rooms, but where the collections are yet to be made the only thing for the architect and Director to do is to arrange a sufficient diversity in the size and shape of their galleries to provide for all classes of material. The commonest mistake is that of making the side-lighted galleries too high and the top-lighted galleries too low. Among the best proportioned and best adapted rooms used for the exhibition of paintings are the new picture galleries of the Vatican. For very large top-lighted rooms those in the Brera, Nos. III, IV, V, in Milan are very attractive, though it would be impossible to use the same height here (36 feet, 9 inches to skylight, no inner ceiling light) as the light is so different, and rooms 46, 61, 63, 29, 34 in the Kaiser Friedrich are also very effective. A masterly discussion of the question of proportion will be found in the Boston Museum Communications to the Trustees, No. III, The Museum Commission in Europe. Nowhere else has this matter been studied so profoundly and nowhere have the results been so carefully tabulated as here.

The question of proportion is intimately connected with the question of light, which leads us to our next subject.

LIGHT

Much the most important subject for consideration in the building of a museum is the relative advantage of top-light and side-light. Some twenty years ago no one would have considered for a moment the use of side-light in a museum. Now the pendulum has swung so far in the other direction that there are some museum men who are unwilling to consider the use of top-light at all, except for modern painting. The usual reasoning is as follows. In the old days artists painted their pictures for rooms in palaces or churches or other places where side-light would be their portion. Now the artist must prepare for the fate which, if he is successful, awaits his pictures in the great exhibition halls all over the world. To put a modern picture, especially a large one, in an ordinary side-light, is to lose entirely the nuances desired by the artist. On the other hand, to put Italian primitives under a top-light is to lose much of their beauty. In this connection it is well to remember certain examples, as for instance Titian's Presentation of the Virgin in the Temple, in the Academy in

Venice. This picture has now been restored to its original place and nothing can exceed its charm when seen in the afternoon, with the western sun shedding a golden glow over the light in the room and rendering all the color in the picture luminous and gay.

If we are to give pictures their full value it is necessary to reproduce as nearly as possible the conditions under which they were painted or for which they were painted. Thus in the Kaiser Friedrich Museum in Berlin, the room which is devoted to the earliest Italian painting, although top-lighted, is so screened by glass as to give quite the effect of the dimly lighted church. Almost all early painting was intended for churches, and while it would be both unwise and stupid to try to reproduce the dimness of the church interior, it is also poor policy to provide too strong a light. We have all suffered in visiting churches for the purpose of seeing paintings, not only from the obstruction of candles, but also from the dimness of the light. In Italy, where the light is so strong outside, the windows in the churches are correspondingly small, and most of us have to accustom ourselves to the lack of light before we can begin to see the treasures that are hidden in this darkness. In France and Germany, on the other hand, where the light outside is never strong,

the windows in the churches have become extraordinarily large, but they have been so filled with colored glass that the light within remains exceedingly dim. A British architect who has made a special study of museums both in this country and abroad, writes of "The excessive glare so loved by the American museum director" (American Museum Buildings, by Cecil Claude Brewer, F.R.I.B.A., Journal of the Royal Institute of British Architects, 3rd Series, vol. XX, No. 10). Yet an excess of light is much more to be desired than the reverse, for while the former can be controlled by curtains, louvres, and other devices, the latter cannot be increased without great difficulty once the building is completed.

More than one student of the subject has pointed out that top-light striking down on oil paintings has the disadvantage of falling upon the top surface of the painting, which when magnified is seen to be composed of little ridges. Top-light, instead of hitting the surface opposite the visitor, hits the upper part of the ridge and leaves the lower surface in darkness, thus giving improper values.

Top-light is unsatisfactory for rooms in which objects in cases are to be shown. If the cases are large, the reflection of the ceiling light in the glass seriously interferes with seeing the objects

in the case. If, on the other hand, the objects are small and are placed in an ordinary desk case, the visitor in bending over the case finds his own image looking up at him from the glass, and it is only by a great effort that it is possible to see the objects on exhibition. Glass cases in general should be placed so that in looking at the objects the visitor should stand at right angles with the source of light. If the visitor is required to face the light, reflection takes place. If, on the other hand, the visitor's back is toward the light his own shadow obscures the objects.

The most difficult question to solve in an art museum is the light for sculpture. The consensus of opinion seems to be in favor of side-light. Let us consider some of the purposes for which sculpture is made. We have representation of religious personages; the decoration of gardens, including decorative monuments; grave sculptures; and portraits. In the first place let us consider what light there would be in a Greek or Roman temple. As we know, there were never any windows. All the light that entered came either from the great front door or, in some Roman structures, from a small aperture in the roof placed in the middle of the building and considerably in front of where the statue of the god would stand. In this way the top-light became in a measure side-

light, through the distance that it had to fall. Of pieces intended for the decoration of gardens it is only necessary to say that the light in which they stood, though resembling in certain ways top-light, in that they stood in the open, was nevertheless modified by the presence of trees and shrubs which intercepted the direct rays of the light and made pleasing effects of shadow on and around the objects. Grave sculpture partakes of both these characters. Architectural sculpture, on the other hand, was never meant to be seen without some overhanging or projecting cornice which intercepted the rays of light sufficiently to give the shadow needed to show the modelling of the figures. Sculpture placed in a top-lighted room may lose much of the refinement the careful sculptor has given it. The shadows are all downward. Where it is necessary, however, to place sculpture in top-lighted rooms it is possible to arrange it in such a way that the figures, instead of standing directly underneath, will receive slanting rays. Who can doubt the beauty of the Fanciulla d'Anzio as she stands in the Terme Museum in Rome, with a softened side light falling upon her in such a way that the shadows play about all the lovely curves of her body? Another classic example is, of course, that of the Venus de Milo, who has stood for so many years in the

side-lighted room at the end of the long gallery in the Louvre. Again, who will not agree that the ancient sculpture shown in that same long gallery is infinitely more attractive by reason of the light and shadow that plays upon it from the windows along the side, than the gallery of modern sculpture in the Luxembourg, where there is strong top-light? [On this subject see Light and Shade and their Application, by M. Luckiesh. (D. van Nostrand Co., N. Y., 1916.)]

In the consideration of side-light much has been said in regard to the necessity of using light only from the north. Any one who is familiar with the side-lighted cabinets in the Kaiser Friedrich Museum will admit the beauty and attractiveness of the south light which streams so warmly into the rooms where hang the paintings of the Dutch and German schools. The only advantage in north light is its convenience to the museum director and the custodians. A north light is always the same.

Direct sunlight is harmful to most classes of objects but cream-colored curtains can easily be provided, which, when drawn together, diffuse the light in the room, and when open are entirely unobjectionable, as they hang by the side of the window. (Compare Vatican picture gallery.)

Light conditions vary so extraordinarily in dif-

ferent places that it is necessary in each case to experiment with the amount of light required. (See Communications to the Trustees, No. 4, Boston Museum Publications.)

The difference between top-light and side-light will never mean anything to the museum director who has not at some time studied the same picture under varying conditions. The writer once had the opportunity of seeing Correggio's Leda in the little side-lighted, white-washed room with the grisaille decorations by Tiepolo in the Kaiser Friedrich Museum in Berlin, where the wonderful charm of the color and the warm and lively composition were a joy to the beholder. A few weeks later the same picture was hung in its usual place in the top-lighted gallery No. 45. The drop in tone and the flatness of the color were very marked and the picture has lost immeasurably by the change. [On this subject see report of the Commission to Experiment upon Lighting of Rembrandt's Night Watch. (The Hague, 1902.) Abridged translation in Boston Museum of Fine Arts' Communication to the Trustees, vol. II.]

But when all has been said on both sides, we come back to the one matter of real importance which is that whether top-light or side-light is adopted, a proper diffusion of the light in the room is the one great desideratum. In order to

obtain this, experiments must be made in side-lighted rooms with the height of the window sill from the floor, the size of the opening, and the proportion of glass to wall surface. In the same way with top-light, the height of the outer sky-light from the floor, the treatment of the space between outer and inner lights, the height of the inner glass ceiling, and the proportional size of this last must all be carefully studied, not only in already established and successful museums, but in the town and on the exact spot where the new gallery is to be located.

In general it may be said that if side-light is chosen for pictures and sculpture it should enter from a height, while for objects in cases and for prints a low side-light is preferable.

Intermediate between side-light and top-light is the clerestory system such as is used in the great hall of the Decorative Arts wing of the Metropolitan and in the basilica of the Kaiser Friedrich Museum. Here the light entering very high is reflected on the light walls of the upper part of the room until it becomes thoroughly diffused and loses definite direction. A successfully top-lighted room should have much the same characteristic; the wall surface needs to be lighted rather than the centre of the room and the problem is to so arrange the angle of light that in passing through

both glass ceilings it becomes sufficiently diffused to give equal satisfaction in all parts of the room.

CEILINGS AND SKYLIGHTS

The great difficulty in museum rooms is to get the height necessary for proportion and good light without making the walls look too high and too dark at the top. After much experimentation, it has been discovered that a ceiling with a cove is best adapted for museum purposes. The cove makes a reflecting surface which sends the light directly onto the walls and diminishes the useless space above the hanging line. In the case of top-light, the cove ceiling is particularly important, for the dark pocket between the skylight and the walls is ugly and wasteful of light. In a side-lighted room, the cove may be much smaller than in a top-lighted room. It used to be thought necessary to make the ceiling glass the full width of the room, but now it has been found that the light is better and the whole effect more pleasing if the glass stops two to five feet from the side walls, according to the size and proportion of the gallery, and this space is filled by a cove. The ribs between the glass of the skylights should be as small as possible as each one casts a disagreeable shadow on walls and floor. By placing the glass at the bottom of these ribs rather than at the top

this effect is minimized. In mild climates the ceiling light is sometimes omitted entirely but the attic space between the outer skylight and an inner glass ceiling is valuable in many ways, especially for ventilation. Excessive summer heat and winter cold are kept confined in the loft above the glass. A warning is necessary here in regard to the space above the ceiling light. It is one of the most important things in the whole museum that this should be accessible, decently finished and large enough to be ventilated and cleaned. The janitor should be able frequently to clean the ceiling lights, the electricians to work comfortably on the wires provided for artificial illumination which is now always above the ceiling light, and the beams and girders should be so placed that it is possible to provide curtains or shades or louvres to exclude too abundant light. Where the loft between the two glasses is small, the heat accumulates in this space in summer and it requires a very efficient system of ventilation to take care of it, but where the loft is large enough, it is easy to arrange openings provided with louvre vents in opposite walls so that a direct draft can be obtained. The dust that enters in this way is a serious matter but the heat in the galleries is worse, and, as the glass of the ceiling lights is usually set with felt, the dust that seeps through

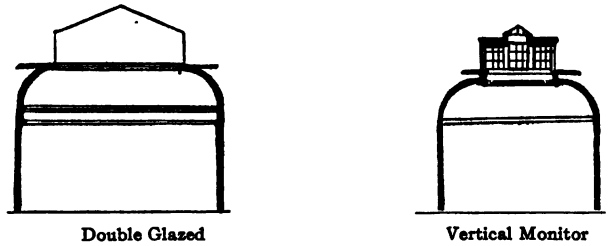
can be taken care of. Such extreme measures, of course, call for more constant cleaning, but the safety of the objects and the comfort of the guards and visitors will be sufficient to offset this. A fine wire screen placed on the inside of these openings will keep out birds and insects. In winter, of course, these louvre vents can be replaced by solid doors which will keep out the cold.

Museums in the north must contend with winter snows. It is hard to keep skylights from leaking if snow is allowed to stay upon them, aside from the darkness of the galleries. Shovelling off the snow is a difficult process because of the danger of breaking glass. Steam pipes should be provided running just under the glass. When snow has fallen the steam should be turned on very slowly and the snow gradually melted away. Heat too rapidly applied will cause the glass to crack. A certain American museum has arranged a sprinkler system for use on the outer roof in case of excessive heat in summer. It has not been working long enough to permit a satisfactory judgment of its efficiency. The same system was tried in Nuremberg but failed because the water poured on the hot glass caused it to crack. A skillful and prodigal use of water might, however, prove effective.

For various types of skylight the reader is re-

ferred to plates in the Museum of Fine Arts Communications to the Trustees, No. III, The Museum Commission in Europe, and to J. Guadet, Eléments et Théorie de L'Architecture, Tome II, Livre VII, Chapter VII; Dr. Heinrich Wagner, Handbuch der Architektur, IV Theil, 6 Halbband, 4 Heft, "Museen."

The monitor or lantern light has been developed in England with much satisfaction and was



Double Glazed Ordinary Skylight

Vertical Monitor With Some Top-light

TYPES OF TOP-LIGHTED GALLERIES

studied very thoroughly by the late Professor Lichtwark of Hamburg who adapted it in various forms for use on the new Kunsthalle in that city. It has the advantage of not becoming clogged with snow in winter, of being easy to ventilate and of reducing the glare of light on the floor in the middle of the room. Architecturally it has a certain disadvantage in that it stands rather high above the surrounding roof of the

building and must either be treated frankly as an architectural feature or screened behind some form of balustrade. Where practical it is very satisfactory and simple to work with.

OFFICES OF THE STAFF, LIBRARY AND LECTURE ROOMS

One of the commonest mistakes made in the planning of a museum is disregarding the fact that there will be a large amount of office work requiring a series of staff rooms. The staff do not need to occupy rooms of the height and proportion usually assigned to galleries, and it is, therefore, a waste of space to put the offices on the main gallery floor unless they are arranged with a mezzanine. There should be, even in the smallest museum, an office for the Director reached through one for the stenographer, and, as the building increases in size, provision for an assistant director, a bursar, a membership clerk, etc., etc. Small rooms are adequate and greatly to be preferred to one large room where many people work together.

An important point in connection with the offices must be the provision for the records of the museum. For them a fire-proof closet or vault should be built, unless the museum is able to provide safes, as the loss of the documents in

connection with any work of art is almost as vital as the loss of the object itself.

Another room which should be easily accessible, not only to the staff but to the public, is the library. No museum officials can be expected to properly carry on their work unless they can be provided with certain readily obtainable text and reference books. Wherever it is possible there should also be a good collection of photographs which will be of the utmost assistance in determining attributions.

An important part of the function of the museum is coming to be the extension of the work of the staff to include lectures for the public. For this there must be provided at least one lecture room in the museum and preferably two. These rooms can also be used for meetings of outside organizations interested in the history of art, and by providing such space the museum becomes the centre for clubs studying this subject.

One of the best equipped lecture rooms in connection with a museum is the one at the Ethnographical Museum in Hamburg. This building has four wings which come together around two courts, forming an obtuse angle on the front. The entrance and vestibule are at this angle and the main galleries of the museum go out on either side. There is a central wing between these two

side wings, which is occupied by the library and lecture rooms, and which joins the fourth wing at the back. This fourth wing contains the work-rooms, store rooms and the rooms of the staff, and communicates directly with the two wings in which is the main exhibition space. The Director's offices are approached by a separate door. The lecture room is thus directly accessible to the public without entering the exhibition galleries. At the back of the lecture hall is a room for the use of the lecturer. The seats are arranged as in a theatre, on the sloping floor, the stereopticon being placed about at the centre of the room on a stand which can be automatically raised and lowered. The lecturer stands upon a platform in front of which runs a long table. Beneath this table the lecturer finds electric buttons which control the shutters at the windows on the sides of the hall. By pressing one of these buttons the metal curtains at the windows are lowered practically without noise and with no effort. Another switch controls the lights, and still a third one the blackboard, which drops like the curtains in Greek and Roman theatres, into a socket in the floor. The stereopticon is a double one and is arranged so that two slides can be thrown on the screen at the same time, thus making it possible to compare very readily two types of material.

Behind the screen is a blackboard which can be used when the stereopticon is not needed. In addition, on both sides are racks upon which maps can be hung and raised or lowered by means of a very simple device. They are so hung that several maps or charts can be arranged, one above the other, and yet so that they can be exhibited with a minimum of effort on the part of the lecturer. Mechanical devices of this sort are a nuisance when overdone. The late Dr. Meyer of Dresden was one of the first to introduce a large number of such systems into his museum and the student will readily perceive which of them are more ingenious than practical. [See F. A. Bather, Many Inventions, Museums Journal, vol. IV, page 202, and Dr. A. B. Meyer, III Bericht über einige neue Einrichtungen in Dresden, 1903.]

Common sense is a prime requisite for any one connected with a museum. It must be possible to tell the difference between a device which will be expensive to instal and not very satisfactory after it is installed, and one which is absolutely essential to the working of the museum. In the case mentioned, the presence underneath the table of the switches which control the curtains and the lights, is excellent. The advisability of having a disappearing blackboard and arrangements for

hanging maps is not so apparent. In buying the stereopticon for the large lecture room it would perhaps be as well to provide a double-barrelled one, as it is certainly very convenient at times to have two pictures on the screen, side by side. Some museums may want to instal a reflectroscope by means of which it would be possible to throw upon the screen photographs or illustrations in books and other opaque material, in addition to the slides. There are several such machines on the market which are fairly satisfactory in a small room and with material which does not exceed 6 x 6 inches in size. Books are not as easily handled as the dealer usually represents them to be, and the strong focussing of light on the photograph or post card creates heat which is liable to burn it up if kept in too long.

Some museums have deemed it wise for the stereopticon to be in an adjoining room. In this case the end of the lens projects into the lecture room through a hole in the wall and all noise of the machine is shut off. In case this is done, some sort of a speaking tube has to be arranged so that the operator can get in touch with the lecturer, as a bell is not always sufficient to explain the lecturer's needs. Where two lecture rooms (a large one and a small one) are arranged side by side, some such system as this might permit

the use of the same stereopticon for both rooms. The stand could easily be made to revolve and if the rooms are not used simultaneously there should be no difficulty. A separate room of this kind is necessary where motion pictures are to be shown and a fully equipped lecture room should not be without it.

The development of the nitrogen lamp has recently quite revolutionized stereopticon systems. A 1000 or 1500-watt lamp attached to an ordinary circuit can be operated noiselessly by even the most unskilled person with satisfactory results. Too much power is not wanted with slides and a cheap machine with good lenses provided with one of these lamps is perfectly satisfactory in a small room. In choosing a stereopticon it is well to remember that if it is possible to load and unload the slide carriage from the side next the operator much fatigue is spared. Constant reaching over to the opposite side of the machine to remove or put in a slide is tiresome as well as slower.

The ventilation of the lecture room should be carefully considered. In case it is impossible to instal the special lecture room system with the outlets under the seats there should always be outside windows which can be opened in case of need. It is unwise to put the lecture room on the

regular circuit in an ordinary system, as the lecturer's voice and the sound of applause can be heard in all the other rooms on the circuit.

WORKSHOPS AND STORE ROOMS

The modern museum must be provided with workshops. Certain pieces of work should never be done outside. It is not always necessary to have workmen constantly employed in the building in all the fields that are needed, but the shops should be arranged so that an expert coming in from outside would not be handicapped. A restorer's studio, a carpenter's shop with a full set of tools and cabinet maker's bench, a printer's office with a small hand press, a paint shop especially fireproofed and not connected with other rooms, a disinfecting room equipped with vacuum tank for the use of the textile department, a plaster moulder's shop, possibly even a small forge, and a photographer's studio are all more or less necessary. Some of these shops may be located in the basement, others, like the printer's office and the photographer's studio should be up under the roof. But wherever they are, they must be arranged so that large objects can easily be taken to and from them. Much better results can be obtained by the photographer with paintings in his studio than in the galleries. Access to the

studio must therefore be provided. Photographer's quarters on the top floor of the museum building, in some out-of-the-way angle not needed for exhibition purposes, are often arranged, but the mistake is made of building a two-foot stairway leading up to them by which large objects cannot be taken to the studio. The main freight elevator shaft should in all cases go to the highest and lowest points in the building, as there is no use in rooms which cannot be reached, and every available space in the museum must be utilized. At the Kaiser Friedrich Museum in Berlin, as in many others of our best planned museums, the elevator stops at the main gallery floor and under the roof are several storage rooms and an excellent photographer's studio. The most complete installation of workshops in this country is at the Metropolitan in New York. Here, in addition to the shops mentioned above, are the laboratories for the care of Egyptian limestones and the restoration of classical antiquities. In the Berlin museums a complete chemical laboratory adds to the equipment for the scientific care of art objects.

In most European museums it is considered necessary to have a caretaker live in the museum building and for his use an apartment is provided. In this country, however, this does not

seem advisable. The janitors by day and watchmen by night are considered sufficient protection for any museum. The extraordinary difference between the frequency with which fire breaks out in this country in comparison with the rarity of its occurrence in Europe, makes an especially strong plea against providing in the museum, rooms which shall be occupied by a family.

Machinery should be kept as far as possible from the main building. In a large museum where a number of boilers are necessary for heating purposes and where an electric plant supplies the power to run the ventilating and lighting systems, this plant is usually placed either outside the museum entirely or in a court. In the old days when the coal supplies were kept on the floor of the boiler house and shovelled in by hand, there was invariably a large amount of dirt which could not be avoided. Now, however, when all up-to-date museums are putting in a self-feeding system of furnaces, the coal or oil is confined in bins or tanks and is passed from them through an automatic device, onto the fire. With such a device the boiler rooms can be kept as clean as any part of the museum. There is a minimum of fire danger, as the fire box is practically never opened. Of course it is necessary to provide especially thick walls with few openings and to avoid

fire danger as far as possible. If this is done there is no reason why the boilers should not be put in the basement of the museum building, provided space is left above to take care of excessive heat. The electric plant is apt to cause vibration and noise and unless an especially silent set of machinery is installed it is much better to place it outside the walls of the museum. Of course it is always possible to use the current supplied by an outside firm but it is much more expensive than where electricity is generated at the building.

Store rooms of various kinds are needed. A large clear space which need not necessarily be lighted by daylight should be provided for boxes. A loan exhibition comes in, is unpacked and the boxes stored; perhaps fifteen or twenty boxes more come in before that exhibition goes out again. The store room must be so arranged that it will be possible to take out the first set of boxes without interfering with the second. Rooms for the storage of pictures and other art objects should be provided on the gallery floors. A small store room next the Director's office for objects offered for sale is a valuable adjunct and a store room near one of the entrances for objects loaned for special exhibitions by local artists is also a desideratum. These objects which are sent in to be passed upon by a jury should not have to be

placed in the store rooms with more permanent material and should also be easily accessible when the artists call for them if they have been rejected or after the exhibition is over. There must also be storage space for janitor's supplies, catalogs and office supplies of all kinds.

FIRE RISK, RESTAURANT

Fire, theft and dust are the three great enemies of the museum Director. For some reason that is hard to explain, we, in America, are subject to a fire peril which is unknown in Europe. In Italy, for instance, it is a common experience to see a carpenter occupying a shop in the ground floor of a big apartment building, sweep together his shavings into the middle of his shop, set fire to them there, and then sweep the ashes into the street. Nothing ever burns down; whereas here with all the precautions that we take against fire we are constantly having terrific disasters. In most cities in America there are police regulations which must be complied with in regard to fire doors, etc., and the law in regard to entrances is very strict. All doors must be made to open out so that in case of fire the exits will not be impeded. The number of staircases, also, is regulated by law and often there are requirements in regard to the thickness of the walls. With all

these things the building committee should be conversant.

An important precaution is the use of fire doors by means of which the different parts of the museum building can be shut off, one from another. These are often made with what is called a fusible link, an attachment which when the temperature reaches a certain degree, automatically closes the door. These doors are never handsome but if they are planned during the construction of the building they can be made to run in the thickness of the wall so that when opened they are concealed. If a plan is adopted similar to that of the National Museum in Munich such an arrangement is absolutely necessary, as a fire once started could spread too easily from one room to another, and what is more, the damage done by the smoke would be very great. Fire doors usually fit so tight that the minimum amount of smoke passes through them. In general, it seems wise to reduce as far as possible the number of places in the building where fires are lighted or matches need to be struck. In the carpenter's shop it is necessary to have an arrangement for heating glue. At the present time, a small electric machine which uses very little current can be obtained especially for this purpose, and these electric gluepots are much cleaner and

safer in every way than the old-fashioned gas heaters.

A source of danger, but a necessary one, comes from the restaurant. It is only in the last ten years that restaurants in museums have been considered feasible. They were not necessary in the old days when the museums were much smaller than they are now, but since it has been the fashion for us to have buildings with the floor area of the Louvre and the British Museum and the Metropolitan, it has become necessary to provide the weary traveller with some means of sustaining life until he can accomplish his object. The size of the restaurants provided differs in different places, although the most complete and most delightful in many respects is the celebrated one at the South Kensington Museum in London. Here it is possible for people of moderate means to get a good and inexpensive luncheon in the large and airy room on the main floor. The epicure may go to the grill, at a slightly increased cost, select his own chop or steak, and see it cooked before his eyes, over a most dangerous and wholly beautiful fire under an enormous chimney. The luxurious may enter a third room fitted with all the appointments of a first-class hotel, where at a price commensurate with the glory about him he may eat an excellent meal.

The number of people who take advantage of this service is really astonishing. People even go there just for meals, but as the restaurant is cunningly situated at the farthest point from both entrances, going there just for meals necessitates passing through a number of the most interesting galleries in the museum, and the hungry wayfarer cannot help absorbing a certain amount of art as he passes by. Restaurants in museums do not need to be on this lavish scale. Even a small room where nothing but tea and sandwiches are served is a great help and a great rest. Some provision should be made for the staff of the museum. The ideal condition would, of course, be to have a small dining room for the use of the staff only, where smoking could be allowed if desired, and another room which should be open to the general public. Museums are usually situated at too great a distance from any centre for it to be possible for the staff to go out to luncheon and return within the usual one hour at noon. Cooking by electricity is the ideal arrangement, but this is usually too expensive to be practical and gas forms a useful substitute.

BAVARIAN NATIONAL MUSEUM, MUNICH, GERMANY

DETAILS OFTEN OVERLOOKED

No building committee should accept plans, no matter by whom they are submitted, without most careful study. There are certain points which every architect forgets, and it is the business of the building committee and the Director to see to it that they are remembered. Such, for instance, are the telephone system, bells, hardware, wiring for electric light, automatic burglar signals, gas pipes, arrangements for vacuum cleaners, and plumbing. All these things must be carefully considered before the building has gone so far that the cost of installation is going to be doubled. There is no reason why locks on the doors should not be considered just as well before the doors are ready to receive them, as after the doors are in place. The hardware is all ordered long before the building is ready for it, and unless unusual needs are specified at the time the plans are accepted there will be extra expense in later changes. Some doors must be locked on the outside and some on the inside only, a certain door must be accessible only to the staff and must, therefore, be arranged to be opened from the outside by a key and from the inside by a handle, but if this same door is so placed that it is possible for a thief to enter through a window at night there

must be an additional lock on the outside of the door to keep him from going out into the gallery.

The position of the radiators, light switches, thermostats, ventilators and all such appliances must be carefully considered so that they will not interfere with exhibition space. In certain cities the fire regulations require the provision of four-inch water pipes with outlets and hose attachments at frequent intervals in the building. The law states that these must be "in a conspicuous place," and great tact and persistent effort on the part of the Director are often necessary in order to have these so placed as to comply with the regulations and at the same time not to occupy the best wall space in the gallery.

In one museum in this country, where no provision was made in the original plan for the offices of the staff, it was decided to use exhibition galleries for this purpose. Although architect and contractor both knew that this was the intention, no change was made in the order for windows, and the great solid and immovable steel and glass windows were put in place before Director and building committee realized that there must be a chance to change the air in the offices in a building that had no ventilation. To cut off these windows and provide a space that could be opened at the bottom was a great expense,

and one that might have been saved by forethought. This simply goes to show that there is no detail that may be overlooked.

Architects in this country think that casement windows in order to be tight *must* open out. There are various disadvantages in this system. In the first place if a strong wind comes up when the window is open the strain on the frame and glass is enormous. The opening and closing of a window that opens out is much more difficult than if it opens in, but worst of all is the screening. On the ground floor of museums, casement windows are often provided. If they open *in* it is possible to put bars and screens on the outside with little expense. If they open *out* it is difficult to bar them and the screens must go inside and be arranged to slide up and down so as to provide access to the fastenings. Ordinary American windows do not give this trouble, of course, but where casement windows are specified they should be made to open *in* as they do in all continental European countries.

There are often dark days in winter when it is necessary to throw on artificial light, and even if the museum is not regularly open in the evening there will be certain occasions when it will be used after dark. Social functions held in the museum are a great help in increasing the mem-

bership and interest of the public. Some scheme of overhead lighting must therefore be arranged. It will also be found useful to arrange a plug in the baseboard which can be used either for special lighting or for a portable vacuum cleaner. Where the museum is to be lighted at night each room should be provided with one bulb on a separate circuit for the use of the night watchman. The question of how the lights shall be turned on and off is a serious one. In the case of a lecture room it should be possible either for the lecturer himself or for the attendant in charge of the stereopticon to turn the lights on and off in the room. In the Director's offices also it will be necessary to provide a switch which can be operated in the room. In almost every other case, however, it will be found much more satisfactory to have the lights operated from a central switchboard. This will obviate the danger which would arise were some visitor suddenly to turn off the light in a gallery. Key switches may also be used to good effect. In the Director's offices, it is an excellent scheme to arrange for a floor plug in the middle of the floor to which may be attached desk lights, as a small amount of concentrated light is often necessary where the room is not dark enough to require the full amount of light. These floor plugs do not need to be used

and can be arranged flush with the floor and with a water-tight top, which is very inconspicuous. If these plugs are not put in until after the floor is laid the expense is enormous. If, however, it is all planned beforehand the expense is inconsiderable.

A more or less complete telephone system is necessary. It must be possible for the different parts of the building to communicate with each other. The Director must be in touch with all that is going on and must be able at any moment to reach the guards. Then, too, the telephone is a necessity in case of theft or any danger, as the guard can quickly notify the gatekeeper and prevent the escape of the suspect. Some arrangement should be made by which telephone communication can be maintained through the night as well as in the daytime; that is, a museum should never be put on a private branch exchange which depends upon a switchboard in some other building operated only in the daytime, unless it is plugged with one of the trunk lines at night. It will be necessary to arrange for a conduit through which telephone and electric wires can be brought into the building and another for gas and water. This conduit should always be placed at the time the foundations are being built, as otherwise it will be necessary to pierce through the wall at

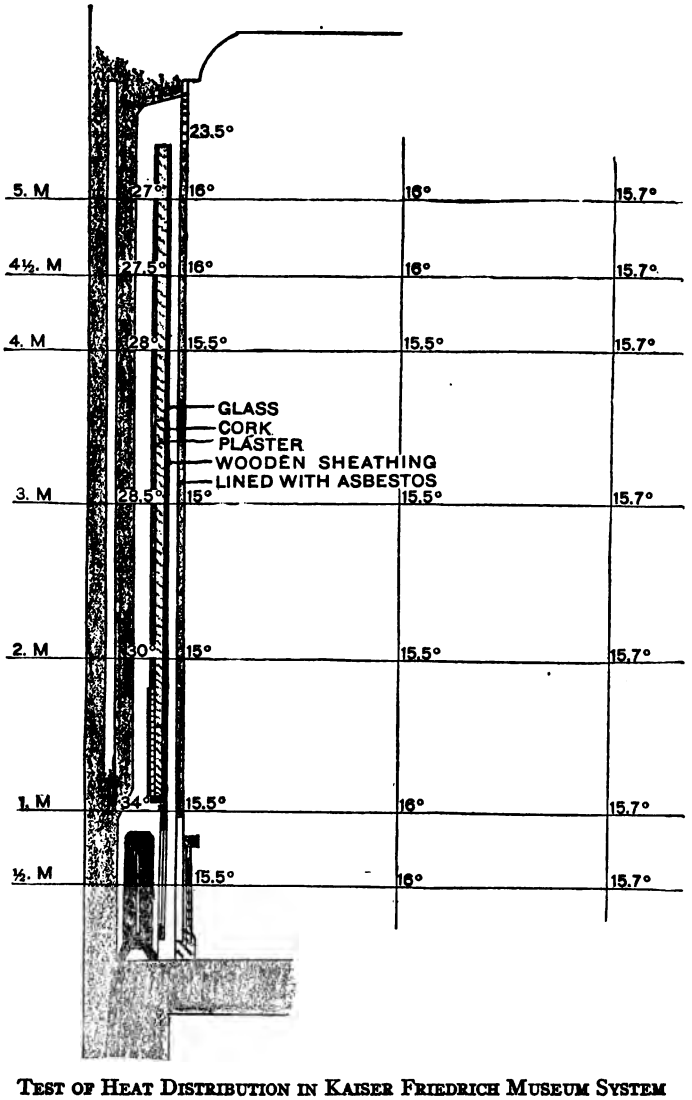
considerable expense. The small pipes running to the different parts of the building can be planned so as to take telephone, electric light and telegraphic wires from the watchmen's boxes. If all these things are planned ahead the expensive necessity of later changes will be avoided. The telephone people, if left to themselves, will bore holes and run their pipes, leaving no chance for any one else. No sooner have they finished than the burglar protection people will come along and need wires in almost the same places. That will mean another set of borings.

There should be at least one drinking fountain where the ever-thirsty public can be refreshed. Few people who have not been obliged to face this realize that not a day goes by without frequent requests for water. On each floor a mop closet should be provided with a slop sink and running water. There should be in connection with the rooms of the staff a chance to wash the hands, for the handling of documents and works of art makes this necessary. The provision of a toilet here also is a desideratum. In the case of a large museum a men's staff room and women's staff room are sometimes provided, and these are given elaborate toilet arrangements. Perhaps the simplest means of meeting all needs is to provide two bath rooms in connection with

the staff offices which can be used as dressing rooms if desired. A public rest room should not be overlooked. Some thought must be given to the comfort of the guards and janitors. They will need lockers in which to keep their uniforms, and a dressing room. This same room can be used for their lunch room and should be provided with an electric plate or gas ring and a sink, so that coffee or other beverages may be heated and bottles washed. They will undoubtedly want to smoke at noon, and this room should therefore be so situated that it will be safe to allow this and also so that it can be properly ventilated without blowing the smoke into the halls of the museum. The public smoking room, or smoking room for the staff, should be entirely separate from this.

HEAT AND VENTILATION

For some unknown reason we in America consider it necessary to place enormous radiators in the middle of our rooms or in some conspicuous place, and as often as not they are placed on the wall which is the most available for exhibition purposes. Experiments conducted in Berlin have been carried out with great care and the Kaiser Friedrich Museum is now heated by a system of radiators placed in every room in niches in the



TEST OF HEAT DISTRIBUTION IN KAISER FRIEDRICH MUSEUM SYSTEM

wall and covered by an insulating wall which absolutely prevents both the loss of space incident to the usual method and the overheating of the wall at one point, which we sometimes find. It may be interesting to those who are about to build a museum, or to change the heating in some museum already built, to see the results of experiments made abroad, which are appended. (See page 62.) It will be seen from this that the temperature in the different parts of the room was extremely uniform, slightly colder near the floor but to no marked degree warmer at the top of the room. The system works perfectly in Germany and should do the same in America. In side-lighted galleries, radiators may be placed under the windows without interfering with exhibition space. In building a museum, the first requisite is to secure good light; the second, to secure available wall and floor space. In almost every case both wall and floor space are necessary. Radiators placed in the middle of a room not only become very disagreeable and ugly pieces of furniture, but they take available exhibition space. Radiators placed in front of the wall render useless the space which they occupy and make the wall directly above them unavailable for exhibition. There is no class of objects which can stand the continued heat. An interesting

article on this subject is Die Lösung der Heizfrage bei Gemäldegalerien und ähnlichen Sammlungsgebäuden, by R. Stegemann, Museumskunde X, page 133.

We have not yet thoroughly come to understand, either, the importance of proper ventilation in the museum. Ventilation does not mean merely provision for a change of air. It means that no air should be taken into the museum that has not been screened and washed. Any one who doubts the amount of dust that is brought in by air can be easily convinced by once being taken to the intake in some building where the air is properly sifted. The system most commonly in vogue is that of drawing the air through cheese-cloth screens. Large wooden frames are provided, over which bags made of cheese-cloth are passed. These bags are scraped one day and changed the next. The amount of dirt which has accumulated on both sides of the bag is so great that it seems incredible. Another system is that of using exceedingly fine copper-wire screens over which water pours continually. The air passes through this screen and the water washes off the dirt which accumulates. At the same time the air is supposed to receive some dampness. This system is thoroughly satisfactory in summer, and if the air is not damp enough already; in winter, how-

ever, when the air needs to be heated there is no advantage in this more costly system, for the dampened air in passing over the hot coils is dried. Another system is usually installed providing either large pans of water, which are placed on the hot coils, or a very fine spray which rises with the warmed air into the galleries.

Another system passes the air through sheets of water arranged one behind another. By warming this water in winter the air is warmed and moistened and so rises to the galleries. Some such system is necessary in order to keep the humidity nearly the same all the year round. A temperature of sixty-five degrees to sixty-eight degrees is right for museum galleries. Curiously enough the Directors of Italian picture galleries find it impossible to heat their museums to the same degree that can be done in London without injury to their paintings, and the cause of this is undoubtedly the difference in dampness in the London climate over that in Italy.

Another very important fact that must be borne in mind is the necessity of keeping the temperature throughout the twenty-four hours somewhere near the same. Where European galleries have failed has usually been in providing heat only during the day. The drop in tempera-

ture during the night has done great harm to objects in the museum.

Sometime a system will be installed and operated by which museums can be cooled in summer and warmed in winter, and the humidity kept practically constant. Such a system has been installed in one of our great museums, but it has not been operating long enough to prove how successful it may be. All these ideal arrangements are very expensive to instal and still more so to operate. It is only the exceptional museum in this country that has a budget large enough to warrant the use of them. Humidity is tested in European museums by hygrometers, which are fixed to the wall in each room. In this country these hygrometers seem to be unsuccessful, perhaps because they are not watched sufficiently closely, and perhaps because they are meddled with by the public. If no hygrometers are provided in the rooms some person in authority should test the air at least once a day in order to tell whether the conditions are right for the works of art. It is not sufficient for us to provide a place where beautiful things can be seen to advantage. We must also provide sufficient care for those things so that future generations will not be deprived of their enjoyment. Thermometers of some kind are always placed in the

rooms. Sometimes a thermostat is used. Like all mechanical devices it does not always work, and must be supplemented by the common sense of the guardians who should not themselves touch the apparatus but simply report to the superintendent of buildings or engineer.

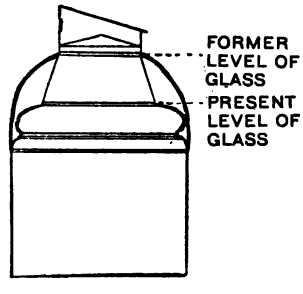
In installing a ventilating system it is well to remember that toilet rooms should always have direct outdoor ventilation, the smoking room must be on a separate duct and the kitchen and lunch rooms on another. The odor of cooking in a museum is out of place, but where the lunch-room ventilator opens into the same shaft as some of the galleries there will always be a smell of food, ventilating experts to the contrary notwithstanding.

It is advisable also to have the lecture room on a separate circuit. (See page 46.)

The staff rooms should always be provided with windows which open, and radiators for heat, and should not have any artificial ventilation. No such system is satisfactory to live with, and individual preference and special conditions call for separate treatment. Dust and variations in humidity will not matter here, but the possibility of quickly airing off the smell of a cleaning compound or of ink eradicator will make a great difference in the comfort of the staff.

HOW MAY DEFECTS IN EXISTING BUILDINGS BE REMEDIED?

In Europe it is the exception for the building in which collections are housed to have been built purposely for a museum, and in this country also many an aspiring institution is located in an old dwelling house made over. The chief difficulties which are likely to confront the architect are con-



CHANGES IN DRESDEN GALLERY

cerned with the height of the rooms and the quality of the light. A room that is too high is quite as difficult to work with as one that is too low, although the remedy is much simpler. Many of the older European museums which were built with enormously high rooms have been found to dwarf the pictures to such an extent and to present such an ungainly appearance when hung according to modern taste with pictures on the line

of the eye and not too close together, that it has been found necessary in several cases to lower the inner skylight. The problem has been met most successfully in Dresden, where the old-fashioned very high rooms have been cut down and provided with a cove ceiling. (See cut page 68.) This gives a large surface for reflection, which if painted in some light color is a great addition to the light which comes in above. The curved surface not only adds to the intensity of the light but makes the division of the walls for decorative purposes much simpler. It is always hard to handle a high wall, as a too great expanse of color is trying and gives an effect of height which is exceedingly unpleasant. The experiments made in various places of covering the lower part of the wall with a material, say, to the height of eight feet, and above that painting a band or frieze in a lighter tint, and then having the ceiling in a third tint, is apt to give more or less the effect of a patch-work quilt. The expense of putting in a false ceiling at a lower level is not as great since we have been able to build with steel and wire netting, as it used to be in the days when wooden beams or expensive stonework had to be used.

The problem of raising the ceiling in a room which is too low is much more difficult. Much can be done by the interior decorator to improve

the looks of the room that is too low, but there have been certain unfortunate mistakes in some of our well-known museums where there was no remedy except to raise the roof. If it is possible to use these low rooms for small objects, they are very delightful and have a friendly appearance which never can result in rooms of the proportion of those on the main floor in the Brooklyn Institute, for example. Inadvisable as it is in building a new gallery to provide only north light, it is sometimes necessary where a gallery is too low and too hot. Where a room has been provided with an ordinary skylight, the heat in summer is often so intense that something has to be done. In that case it is sometimes possible to build a saw-tooth skylight admitting only north light. This will obviate the difficulty by excluding the sun, but gives a cold and unattractive light except for certain modern pictures. Another solution which can be used in certain places is that of providing the so-called Monitor light, which has been worked out by Professor Lichtwark in Hamburg following the scheme originally used in England. These Monitor or lantern lights are valuable especially in cases where the skylight has been made too close to the ceiling glass and where there is not enough ventilation. The form of the lantern in itself makes possible

a much greater amount of ventilation through the skylight and the fact that it has a solid roof makes both the glare and the heat admitted less intense.

In the case of rooms which are by nature dark, where the diffusion of light is poor, something may be done by the use of prismatic glass, although its makers no longer claim for it the tremendous power it was thought to have when first discovered. One of the most interesting uses of prism glass may be seen in the Fogg Art Museum at Cambridge, Mass. There it is used as a supplement to the glass in the ceiling placed at an angle to it and diffusing the light in certain sections of the room. The problem there was that the light was too great in the front of the room and too little in the back. The diffusing glass placed at an angle has corrected this, so that now the light is evenly distributed throughout. Intensity of light is one of the most difficult things to gauge with the naked eye and a prism glass will invariably give the effect of darkening the room when used in side-light windows, from the fact that the observer cannot look through it. It has been claimed that the intensity of the light admitted through prism glass is the same as that admitted through ordinary glass, but the diffusion is much greater. Thus, a room opening on a small

court or a side street, where the only good light is in the immediate vicinity of the window, can be made usable by supplying a glass which will deflect downward rays and turn them into the room.

CHAPTER III

Preparation for the Collections

INTERIOR DECORATION

THE finish of the walls in the galleries will to a certain extent determine what may be done in the way of decoration. Where marble or stone facings or wooden panelling is used no further decoration is needed. If the walls are of plaster there are several methods which may be considered; 1. to leave the plaster rough and tint it; 2. to leave the plaster smooth and paint it; 3. to stretch a material over it; 4. to sheathe it in wood and cover with a textile.

If any of the first three is used, paintings shown in the room must be hung from a rod or bar. (Vide infra, page 121.) With the last, however, they can be suspended on hooks or nails driven into the wall.

The rough plaster wall, tinted, is the cheapest method of all to use in decoration and has numerous advantages. It is much to be preferred to

smooth plaster in that it gives a slight unevenness of surface which is a distinct advantage because of the vibration of color thus attained. Water color, while it does not last as long as oil paint, is so much cheaper and quicker to put on that it becomes possible to do over a gallery after a year or two without any more outlay than oil paint in the beginning would have necessitated. If a spatter is used, charming effects may be obtained at very little cost. This method has been tried in various places but has nowhere succeeded so well as in the Minneapolis Institute of Arts. Here a flat ground tint is used, then a large spatter of another color and finally a small spatter of a third. As an example, one room has a reduced white background, a large spatter of a lilac or pale lavender, and a small spatter of golden yellow. These colors are none of them distinctly seen but the general effect is of an interesting surface which forms a good background, especially for the oriental collections shown in the room. Oil paint should, of course, always be used near stairways or where there is a chance of its being much handled, as, if dirty, it can be washed. [The hand rail of a staircase should always be of a material that can be cleaned. Sandstone is inappropriate for this purpose.]

Should method three or four be used the dis-

cussion of textiles which follows will apply. Four is by far the most satisfactory, convenient, but expensive method for use in picture galleries and may be rendered as safe from fire danger as any by the use of asbestos covering for the wooden backing or by impregnating the wood with one of the fire-proof chemicals placed on the market for this purpose. If this same chemical is to be used on the textile, it will affect the color; a small piece, therefore, should be tested before the gallery is hung. Care should be taken, however, that such a chemical, if used, is not of a character to injure the works of art which will be placed near it. In certain galleries of the Chicago Art Institute asbestos paper has been used without any textile above it, simply tinted in water color, and has proved a perfectly unobjectionable temporary makeshift.

TEXTILES

What are the requisites in a good wall covering? First of all, it must be adapted to the objects for which it serves as background; second, it must be durable; third, it must be of a sufficiently close weave so that the dirt will not catch; fourth, it must not show nail holes; and fifth, it must not fade, or, if it does fade, it must fade to some agreeable tone.

In regard to the first requisite, one must choose a material which will have something of the character of the period to which the objects belong. In this country, with our admiration for oriental things, Japanese grass-cloth has been considered a suitable wall covering for use anywhere, but as a background for Italian pictures of the fifteenth or sixteenth century it is inappropriate. Yet there is something to be said in its favor. There is a richness of tone in the grass-cloth which harmonizes well with the gold frames and rich colors of the Italian paintings, but if we are to see these paintings in anything like their original surroundings we must see them with a background either of some rich wood-work or a silk brocade.

Probably burlap has been more used than any other material in our galleries, partly because of its loose texture and partly because of its cheapness. The experiment of painting the walls under the burlap has been tried in different places. This gives a varied effect that makes the material much more attractive, and burlap should never be used unless some such expedient is resorted to, as the dead tone of the natural color is monotonous. The green burlap so often used fades atrociously, as many museums know to their sorrow. This fabric, like all coarse materials of this character,

collects dust very rapidly and is hard to clean. It may, however, be painted over to freshen it when it becomes soiled, although this is not recommended, as the material shrinks unevenly and is apt to hang in festoons after being painted. Beware of gilding burlap, as has sometimes been done, for it is bad taste to gild so coarse and cheap a fabric. In figuring the cost of burlap it must be taken into consideration that the price of hanging is the same for a cheap material as for an expensive one, and, therefore, the initial cost will differ merely in the price of the goods. Fortunately, there are many rich men interested in our museums who are glad to make up the difference in price. Certain other inexpensive materials are on the market such as homespun, monk's cloth, friar's cloth, etc. These are all of a closer weave than burlap and less suggestive of potato sacks. The homespun makes a particularly good background for prints. Some of the sun-dure materials are also attractive in color and weave, although they need to be lined for wall coverings. In the slightly more expensive materials there are some good jutes on the market which come in pale grays and fawn color and which may be dyed according to taste. Some of these are very attractive, especially where the pattern is small and inconspicuous. They make particularly good

backgrounds for certain XVIII and XIX century objects.

If the wall is sheathed with wood, the textile whatever it may be, will need to be lined, otherwise the dirt will collect in the cracks of the wood and gradually show through in streaks. A cotton lining is best, but if too expensive, paper may be used.

Pattern is a very serious consideration. A certain amount of inequality in the weave of the material enhances its value as a background because the light and shade that comes with an uneven surface makes the color less constant, and, therefore adapted to a larger number of objects, but where the pattern is too large it becomes obtrusive and suggests the landscape wall-paper used by our Colonial ancestors which was never meant as a background but which, on the contrary, in itself decorated the room.

Velvet makes an interesting wall covering, but it is a great care, especially if exhibitions are to be changed frequently. Should the museum Director choose a velvet, he must be careful that the pile is short, as otherwise the marks made by the frames will be very conspicuous. Also, a velvet with a short pile is easier to keep clean, as the dust clings to a long pile and is almost impossible to brush off. A velvet wall covering should be

brushed or cleaned with vacuum at least every six months in an ordinarily clean city and oftener where the air is dust-laden.

Among the most attractive backgrounds, especially for ancient pictures, are the reproductions of the old Italian or French brocades. These reproductions are comparatively inexpensive and may be had from the manufacturers in Italy. If carefully chosen as to pattern and color they are satisfactory, well woven and durable. They may be had in linen, silk and cotton, or pure silk, as desired. Where it is possible, these materials should be bought directly of the Italian manufacturers, as our American buyers usually procure their stock in France, thus necessitating payment of double duty. The beauty and durability of these fabrics is proved by the wall coverings in the Vatican Pinacoteca and the Casino Borghese in Rome. Certain of the German museums have been successful in the use of stencilled wall coverings. In this case an inexpensive Arras cloth in plain color is put on the walls. A pattern is then added by means of a stencil and shaded in such a way as to imitate old brocade. (See Museumskunde, vol. I, p. 1, Bode, Das Kaiser Friedrich Museum in Berlin.) At the Kaiser Friedrich Museum in Berlin, for instance, some of these imitations are remarkably good. This is, how-

ever, a subterfuge and one which is not wholly justifiable. The reason it was done in Germany was that it was found difficult to obtain a German made silk brocade which was fast color.

Care should be taken that the material used has no wool in it, as few museums are free from moths, and the greatest care must always be taken to eliminate any possibility of their getting in. Frequently flannel or cashmere is used as a background in cases and occasionally the woolen cloth used in making soldiers' uniforms has been considered a proper and safe background for a case. Nothing attracts the moths more quickly. If felt is needed a cotton or linen felt should be chosen and never a woolen one. There are many charming wall coverings that are made with some woolen threads. These must be excluded from a museum, as the danger is too great. With the impossibility of eliminating dust is bound to come the presence of the moths, who love dust and seek it.

COLOR

One of the most fascinating studies which the museum director must undertake is that of color. On this subject much has been written and good authority may be cited for almost any choice that may be made. One of the most interesting articles on this subject is that written by Professor Dede-

kam of the Central Museum in Trondhjem, Norway. The substance of this paper was presented to the English Museum Association at one of their annual meetings. Museums Journal, Vol. IV, p. 173. See also introduction to the guide to the Parma Gallery, by Corrado Ricci. Color and its Application, by M. Luckiesch. New York. 1915.

Red is beginning to be used again in some of our galleries. Some twenty years ago when Corrado Ricci was doing over the Brera, in Milan, he used a green which has since become known among museum men as "Ricci green." This was so much in vogue at one time and it was considered so perfect as a background that almost all of the older museums became imbued with the desire to tear off the beef-blood red in fashion fifty years ago and be up-to-date by using what they supposed to be the "Ricci green." The original color in the Brera has faded to such an extent now that almost any shade of green may be called "Ricci green" with impunity. Undoubtedly certain shades of green are more becoming to paintings than almost any shade of red, but it is impossible to generalize in regard to color. A very important point, however, that should be taken into consideration is the fact that to the average museum visitor a series of gal-

leries in which the background colors are made to harmonize from room to room is much less tiresome than a similar series of rooms in which the backgrounds are all of the same color.

Careful study should be made of the paintings that are to go in any one room before the color is selected. Where the collection is growing rapidly, certain rooms should be devoted to certain schools, and a study should be made of each school with a view to determining the color which will be most successful as a background for that school. In this connection, the environment for which the pictures were painted should be considered, as important hints may be obtained from such a study. If a color characteristic of a period is to be used, however, it must not be too vivid, as otherwise it will clash with the objects, all of which have faded with time.

In studying any treatise on color of backgrounds, it is necessary to consider the fact that the light in the different countries varies in intensity, and therefore a color which is beautiful in Italy is not necessarily equally suitable in the United States. Few of our northern cities have at any time of the year the brilliant, glowing, penetrating sunshine that is a characteristic of Italian weather. Even rainy days in Italy are not as dark as rainy days in the North, and the chief

necessity in an Italian Museum is to exclude the abundant light. In Germany, on the other hand, the prevalent winter weather is gray and foggy and the light in summer never becomes exceedingly brilliant. A color, therefore, in Italy will look much brighter than that same color in Germany. The position of the gallery and the light which enters will also tend to make the same color look different in different rooms. Thus, for instance, in Berlin, in the Kaiser Friedrich Museum, almost all the side-lit cabinets to the south are covered with the same green velvet, but the color seems quite varied in the different rooms even though they all have approximately the same exposure. In this country most of our museums are so situated that the light which they receive is about half-way in intensity between the light of Germany and the light of Italy. What is true of the German light is also true of light in France and in England, with the exception of London and Liverpool, where the dust and soot in the air further increase the grayness. In Sweden and Norway and other northern countries the light is much more nearly like ours in America, but even here it would be a doubtful experiment to copy directly any color used in a museum without first trying it in this country. Successful backgrounds are rare, as we have already said, nor can

the same color be used with equally good effect for sculpture and painting.

Of the many successfully decorated galleries to be seen in Europe, among the most typical is the new picture gallery of the Vatican, where a deep earthy-green moire covers the walls and harmonizes delightfully with the Italian walnut of the woodwork. Perhaps no more successful single example of gallery decoration exists than this. The color brings out all the most beautiful tones in the pictures, the design is enough to give variety, but not enough to be disturbing. The whole atmosphere is that of refined simplicity, a very rare attribute of a picture gallery. One European gallery made the tremendous mistake of thinking that a color which did not appear in any of the pictures would be the most successful background. The room contains paintings by Rubens, Snyders, and other Flemish artists of that time, in whose pictures red predominates. The color chosen for the walls was also a red, but one which did not appear in any of the paintings. The effect was terrible. Almost any of the reds used in the pictures would have been better.

In a certain German museum there are two rooms which will serve as illustrations of the good and the bad in the use of daring colors for back-

grounds. One is a room hung with a cerise satin which has a blinding and dazzling effect upon the eyes of the visitor. No one who has seen it could ever forget it. To make the effect worse, the room is top-lighted so that the glare upon the lustrous surface of the satin adds to the brilliancy of the color and one finds that after looking at one or two of the really beautiful objects displayed in the room, one is seeing green spots and feeling so faint that one moves quickly away. Equally daring, but far more successful is the use of color in the second room where a soft violet about the color of little wood violets has been used as a background for some XVIII century Italian paintings, Canalettos, Guardis, etc. Never have pictures of this period appeared to such wonderful advantage. The soft pearly tints of the sky and water, which ordinarily look so gray, against this color become transparent, opalescent, vital, and the atmosphere of Venice lives again. Compare these with other Canalettos which have been placed on a dull, dust-colored background, where they seem to have lost all power of expression, and it is easy to judge of the influence that the background has on the picture. The Rubens room in the Louvre in Paris is by common consent one of the best examples of a room decorated for a special purpose.

Considering the success with which reduced white has been used in the rooms of the German primitives in the Alte Pinakothek in Munich, it is rather remarkable that this color has not been more in vogue in this country. One of the few instances where it has been successfully used is in the rooms devoted to the study series of paintings in the Evans Wing of the Boston Museum. Here the rough plaster has been left in its natural color, which is a reduced white. Another room where this color has been used is the gallery for paintings in the Fogg Art Museum, Cambridge, but here the north light makes the color appear somewhat cold.

A word of warning is, perhaps, not amiss in regard to samples. Any color depends so largely upon the light in the room in which it is to be used that it should be tried out with a large sample actually on the walls of the room before any decision is made in regard to it. Wherever possible, also, one of the pictures which is to go in the room should be placed against the color to try the effect. A certain wall covering which has been used recently in this country which, in the sample, is a lovely green, on the walls of the room in which it is hung appears much too brilliant. Another green which in the sample looks rather unattractive, as a background is one of the best.

In the use of textiles for wall coverings many museum Directors have been disappointed to find that the color faded very rapidly after being put on the wall. To offset any such misfortune, it is only necessary to cut off a small piece of the material to be used and to expose it to strong sunlight for a week or two. By comparing this small piece with the larger sample a tendency to fade can easily be discovered.

It has generally been conceded that for sculpture in marble a warm darkish tone is much more agreeable than a cold light tone. Here we have to deal with a cold light surface, in which the shadows are all-important. If we can place it in such a way that it will receive a warm light and be surrounded by a color which will make the shadows darker, we shall have best attained our object. Terra cotta figures, on the other hand, already have a considerable amount of warmth and it is not well to place them against too strong a color. Bronzes, being by nature dark, look well against a larger variety of backgrounds than marble or terra cottas, yet here, too, care must be taken that the color is not too light, as otherwise the contrast will be too sharp. The red color used as a background in the Naples Museum in the room of the Farnese Bull has been highly praised as an excellent color for sculpture, its warm and glowing

tone enlivening the cold marble. A more attractive room is the small gallery in the Terme Museum in Rome, where the Fanciulla d'Anzio stands. This is hung with a blue cloth, according to classical precedent, which may be variously described according to the nomenclature in fashion, as Nattier blue or old blue. The warm, creamy tone of the marble is particularly beautiful against this cool background.

A similar color is the Gothic blue used with much success in the Minneapolis Institute of Arts where, as a background for wooden sculpture, tapestries and paintings shown together, it has been much praised. It is difficult to find a color which will show off equally well a collection of miscellaneous objects. An atmospheric blue, such as that described as Gothic blue above, and the blue used in the Altman collection at the Metropolitan Museum in New York are very effective. There is also a gray-brown which was used in the Renaissance rooms at the Minneapolis Institute of Arts which has similar properties.

OTHER BACKGROUNDS

Another background which has been used successfully for paintings is wooden panelling, such as may be seen in the rooms containing the German and Italian primitives in the Evans Wing

of the Boston Museum. Here the wood is oak, slightly stained but not polished. In the central cupola room of the Dresden Pinakothek, a very elaborate panelling of some dark wood, perhaps walnut, has been used. This is darker in color and forms an admirable foil for the gold of the frames and the jewel-like colors of the wonderful paintings shown there.

In the long tapestry gallery connecting the Evans Wing with the main building of the Boston Museum the walls have been lined with blocks of travertine brought from the neighborhood of Rome. The effect is delightful. There is a certain warmth of tone in the travertine and an unevenness of surface that make a beautiful background for the tapestries hung in this hall. A similar use of stone may be seen in some of the galleries of the Kaiser Friedrich Museum in Berlin.

FLOORS

The question of floors is a very varied one and leaves much to the taste of the individual museum Director. It has usually been considered that in the main entrance hall and in the corridors on the ground floor marble is the most appropriate; this particularly because marble can be easily washed. The marble to be used varies, according

to the amount of money at the disposal of the building committee, but one of the most attractive floors is that of Tennessee marble. The finish is important, the so-called "honed" surface being the best. A polished surface which reflects the light is undesirable and gives one the feeling of being in a Roman bath. An illustration of this may be found in the Glyptothek in Copenhagen. The rich materials here used no longer form a background for the beautiful statues that are shown in this building, but instead overwhelm one with their grandeur and importance and above all with the myriad reflections which come from every side, thrown off by the polished marble. In this connection it may be said that a white marble is even more trying than a colored marble because the whiteness adds to the reflections a glare that is most objectionable. A soft gray or monochrome should be selected, both on this account and because it will show dirt less. All the corridors that are most used and the stairs should be finished in some material that can be easily washed, as otherwise the tracking of a large number of people will give a most unsightly appearance. An ordinary limestone wears off in dust much more quickly than the harder and firmer grained marble. In this connection, as well as in other points to be considered in the building,

NOTE THE EXCESSIVE GLARE AND THE REFLECTIONS IN THE MARBLE,
GLYPTOTHEK, COPENHAGEN, DENMARK

it is necessary for the museum Director to remember that the function of the museum is to form a good setting for the objects in the collections and not to be in itself more interesting or more beautiful than its contents.

Tiled floors have been used rather freely in some of our museums, and in the National Museum in Munich the attempt has been made to have the floor representative of the period; thus, a room containing Roman remains is finished with a sort of terazzo. The room with Romanesque and Byzantine silver has a tiled floor. The Gothic room has also a tiled floor but the tiles are of a different pattern. In the Boston Museum the corridors in the main building are tiled, but the tiles have been laid in such a way that there are little grooves between each of them. This makes a roughness which not only hurts the feet but makes the wheeling of a truck both difficult and dangerous to the objects upon it. If tiles are used they should be laid flat and as smooth as possible. The advantages in a tiled floor are: 1. it is washable; 2. it is cheaper than marble; 3. it reflects the light very little; 4. it sheds the dust easily; 5. it is more easily repaired. The terazzo floor is liable to crack with changes of temperature or slight shifting of a building, and should be avoided. Concrete is the cheapest but

is hard to walk upon and should always be painted, as otherwise it is impossible to keep it clean.

The most agreeable floor to walk upon is cork tiling. The process has not been sufficiently perfected yet to be thoroughly dependable, however. Some treatment will doubtless soon be invented which will preserve the surface and render it more durable. It is noiseless and unobtrusive in coloring and very restful to stand upon. Hardwood floors are useful and agreeable, and the museum visitor will always be grateful to the architect who has provided them. In order to make these fire-proof, the parquet is laid in mastic cement. This black liquid, containing a certain amount of creosote, is poured hot upon the concrete and the little wooden blocks are laid in it without nails. This device holds the floor firmly in place and there is little danger of the seams opening up or of its becoming uneven. If the blocks are not laid directly in the mastic they are apt to become loose with time. The mastic also helps to deaden the noise of footsteps. In using a hardwood floor, it is well, if possible, to lay it in a pattern with small blocks, as where the floor is laid without a pattern, using long strips, there is found to be more wear and tear in certain places than in others and it is more difficult to replace a worn patch in a floor laid in this man-

ner than where there is a definite pattern which permits taking out a small portion and laying new pieces in that place. Only one kind of wood should be used in a room and the grain should be as nearly matched as possible, as more than one color in a floor is disturbing. Laying floors with a pattern in this way has another advantage in that it gives a variety in passing from room to room that is most agreeable.

As for the finish of these wooden floors, the most attractive and also the most expensive is wax. It is more attractive because it was most used in the periods which are usually represented by the objects in our museums. It is much cleaner than the oiled floor, because a floor which has once been treated with oil must, in order to be kept in good condition, have the treatment repeated at frequent intervals. This means that the floor gets darker and darker with each additional coat, and particles of dust which sift in after lying on the floor, absorb sufficient oil so that they become more or less of a menace to any delicate objects which may be in the room, as in sweeping there is bound to be a certain amount of dust raised which will not fall back on the floor again but will alight on the objects in the room. A varnished or shellaced floor may be so treated as closely to resemble in finish the waxed surface

and is much more easily kept in condition than this latter. To avoid reflection the shellac or varnish must be rubbed down until the gloss has disappeared. The waxed floor is the most agreeable, but here the museum man must be cautioned that it requires very frequent cleaning and polishing. If a floor is allowed to go too long without polishing, the wood becomes worn by the dirt brought in on the visitors' shoes and will never look as well again. In a museum with the ordinary number of visitors, the floors should be polished by the janitors once a month; if the attendance is especially large, every two weeks.

Certain museums, both in this country and abroad, have used linoleum or some sort of cork compound on their floors, and this has two advantages. In the first place it is much less tiring for the museum visitor to walk upon and in the second place the clicking of heels that is often so annoying, especially on marble and tile floors, is almost completely silenced by the linoleum. The disadvantages are, in the first place, its great expense, and in the second place, the disagreeable odor that it emits when wet. Many of the Italian museums protect their floors with strips of rope carpet which are very strong and durable, also very difficult to clean. A vacuum cleaner is the only thing that can be used on them

and even this never seems to fully remove the dust. In the Pinakothek in Dresden the experiment has been made of using a carpet with a thick pile in one of the rooms. This is, of course, a great luxury and is most welcome to the museum visitor, but whether it is practical or not one is inclined to doubt. At the time that the writer was in Dresden, the carpet had only been laid a few months and looked very well, but one would want to see the carpet after it had been down three years in order to judge whether the expense was justifiable. The fire danger is, of course, slightly enhanced by a carpet, and also as a moth breeder it is to be avoided.

TRIM

Marble doorways and baseboards should never be used in exhibition galleries. The reasons for this are, that the museum Director is hampered, in choosing the color of his decoration, by the color in the marble, and, as stated before, the museum must not be in itself so grand as to rival in interest the exhibits. A plain wooden trim in a neutral tone, neither too light nor too dark, is to be preferred. In many cases it will be found possible to do away with door trim entirely, making the plaster turn around the opening. Where the floor is of marble the baseboard should also

be of marble because of ease in cleaning. For the same reason, when the floor is of wood the baseboard should be of wood. The so-called hospital finish is of doubtful usefulness in a museum and it must be remembered if this is specified that no furniture, pedestal, or case can be made to set really flush with the wall.

GALLERY FURNITURE

An eloquent plea for seats for museum visitors was made by Dr. Grosse, of Freiburg, at the Mannheim conference, in his article entitled "Die Ausstellung und die Bezeichnung in Kunstmuseen," and many other museum men have followed in his train. It is now universally the custom to provide some sort of seats. What they shall be depends upon the taste of the museum committee and director. The Vatican picture gallery is in this respect, as in many others, a model. In the deep window embrasures are built wooden benches of simple design with backs reaching up to the high window sills, while in the middle of the room are modern copies of the comfortable renaissance folding armchairs with leathern back and seat. These look well and lend dignity and character to the room. The Kaiser Friedrich Museum also uses this type of chair. Some museums use really old chairs of

inferior merit for this purpose, but they are never as satisfactory as modern copies because they are more fragile and are not plainly intended for the public. A copy of a chair of ancient design is more appropriate in galleries containing old things than a modern oak chair. In the modern galleries modern chairs can be used. They should not be too heavy nor too comfortable. There is a type of expensive wicker chair which makes a good-looking gallery chair. Benches without backs are less conspicuous than those with backs, and if simply designed are very pleasant additions to the gallery. The museum that is short of funds should be content with ordinary bentwood chairs with cane seats. They may be finished inconspicuously to simulate "fumed oak" and are light, durable, cheap, and portable.

For a top-lighted gallery, most of the museums which are provided with radiators in the middle of the room have resorted to a system of masking the radiator by a circular bench. This makes a heavy and cumbersome object in the centre of the room which greatly detracts from the continuity of the impression one gains when entering the gallery.

There should be, in each room, or in every other room at least, a chair provided for the custodian in order that he may not be obliged to be on his

feet all day. He should not use the chair if there are people in the gallery, but there are many hours in the day when he could use it when there is no one present.

There is an art in the arrangement of furniture in a gallery. Brass rods or silken cords to keep people from going too near to objects of value are unsightly and have a bad psychological effect. Children always want to crawl under a rope "just to see what will happen," while grown-ups invariably long to touch objects marked "please do not handle." Skilfully adjusted chairs and tables have the same effect as cords or rods, but seem so naturally a part of the room that no one realizes that they are placed under some valuable tapestry to keep the public from handling it. This is one of the strong arguments in favor of the so-called "period" arrangement of rooms; that is, if you have a notable tapestry or fine painting of renaissance workmanship you can keep the public at a proper distance and at the same time improve the appearance of your gallery by putting a fine chest or an old credenza underneath it. A framed tapestry is much less apt to be handled than one hanging loose. In the case of wooden sculpture, furniture cannot be used to keep the public away. Here, the object must either be placed in a glass case, which is necessary if the

polychroming is in a delicate condition, or rope must be used. If ropes are used the standards must be heavily weighted in the base. Iron or brass rods firmly fixed to the floor should never be used because, if they are moved, the holes in the floor always show.

GLASS

In equipping top-lighted galleries, the building committee and the director will find themselves confronted with the interesting problem of choosing suitable glazing. Under present conditions, on account of the war, this will prove a difficult matter, as all the glass best adapted to gallery purposes was produced abroad; the finest of all in Belgium. There are a number of requisites that need to be complied with: 1. the glass must be as white as possible; 2. the figure must be inconspicuous; 3. it must be so designed as to hide beams, outer skylight and electric fixtures; 4. it must diffuse the light well. In order to test these different qualities it is well to arrange in the ceiling of one large room samples of different glasses available in the market. The samples should not be too small, four or six large sheets of each should be used. It will be found that the ordinary ground glass, while it answers the second and third requirements best of any, has yet

so green a color that the wall beneath changes perceptibly in tone. The white cathedral glass is thinner than most and perhaps for that reason gives the whitest test; it conforms to two and four also, but is not very successful in three. The rippled glass which has been used in the Metropolitan fulfils all four requirements well. It is subject to one disadvantage, however, in that it is made only in small sizes.

The danger of breaking a pane of glass is great, especially during cleaning, but there is no wired glass on the market sufficiently clear to be used in skylights. Wire netting stretched under the glass serves the same purpose.

The color can be seen in a small sample on the cut edges. All thick glass shows green when cut, but the shade and intensity of the color vary with the kind of glass. On this subject see: Charles L. Norton, A New Era in Interior Lighting. Technology Quarterly, vol. XIV, No. 1, page 33. E. J. Edwards, The Lighting of Rooms Through Translucent Glass Ceilings, paper read at the eighth annual convention of the Illuminating Engineering Society, Cleveland, Ohio. September, 1914.

VELARIA

In many matters the museum man would do well to copy methods of installation used by the dealer. The psychology of the art loving and art buying public is studied by him to a profound degree. And yet one abomination has been invented which the dealer persists in using that should never find a place in a museum. This is the velarium. Whether in its form of stained-glass canopy, or as a thick velvet ceiling or as simply a thin cheese-cloth umbrella with flounces on the sides it has no place in a gallery. The mechanism that holds it up is always visible and clumsy, it catches quantities of dust, it dwarfs the size of a room, it gives one a very uncomfortable sensation of heavy pressure on the head, and it is impossible to clean. There is no doubt that the excessive glare on the floor of a gallery is disagreeable, but this may be remedied in various ways, by curtains above the ceiling lights, by fin-like diffusing glasses, and by means of the louvre-like revolving shutters above the ceiling glass such as have been used in Cleveland. The velarium does not in any way increase the amount of light on the picture, it simply darkens the spot in which the spectator stands. On this subject

see: Communications to the Trustees IV, p. 14, Boston Museum Publications.

On the subjects so far discussed there are interesting and highly instructive articles by H. Dedekam, Reise Studien, Museumskunde, vol. I, pp. 75, 153, 229; vol. II, p. 92. F. A. Bather, Presidential Address, Museums Journal, vol. III, p. 72, and appendix, p. 110. Sir W. Armstrong, Necessity for Æsthetic Harmony Between Museums and Galleries and their Contents, Museums Journal, XII, 133. E. Rimbault Didbin, The Care of Art Treasures, Museums Journal, vol. XII, p. 101. Benjamin Ives Gilman, Aims and Principles of the Construction and Management of Museums of Fine Art, Museums Journal, IX, 28. L. Réau, L'Organization des Musées, Paris, 1909. Julius von Schlosser, Die Kunst und Wunderkammern der Spätrenaissance, Leipzig, 1908. Theodor Volbehr, Das "Theatrum Quicchebergicum," Museumskunde, V, 201. M. E. Chevreul, Principles of Harmony and Contrast of Colors.

CHAPTER IV

The Formation of Collections

ACCORDING to the American system, a museum is an outgrowth of the educational need of the community and does not come into existence necessarily because of an already formed collection waiting to be housed. This condition renders a museum director's problem much more difficult than that faced by his European confrère who, almost invariably, finds himself in charge of an already formed collection. The American museum director must first of all make a careful plan by which he will be guided in the future for the scope and the direction of the activity of his museum. Where the people of a city need art, they often do not know what kind of art is going to be best for them, and the museum director must help them to choose wisely. The first necessity, therefore, that confronts the committee and director in planning a new museum is to study the needs of the city in which the museum is to be placed. If, for instance, there is already in existence in the city

some collection which with proper tact may eventually come to the museum, it is the duty of the committee to plan the collection which they are to buy in such a way that it will not cover the same field. But the existence of private or other collections is not the only thing to be considered. There are two ends in view in adding the museum to the educational equipment of a city. One is the development of a high class of artisans producing a more artistic grade of manufactures. The second is the general cultural development of the community. In order to do their duty by the first of these classes, the committee and the director must study the manufactures of the city. They should make a survey of the kind of artistic products which are being turned out and then see how the museum could be made of interest and value to the workers in these different manufactories. For instance, in a city where a large amount of glass is produced there should be in the museum a representative collection of glass of all periods and countries. Very often, collections are made by wise manufacturers for the use of the workmen. One of the most interesting of these collections is in Dresden, where Herr Kuhnscherf, a prominent iron manufacturer, has a collection of early German hand-wrought iron locks, keys, knockers, gates,

window bars, etc. This is open to the workers, and the men are supposed to spend a certain amount of time in studying it, the idea being that they will have a greater respect for hand work and inspiration to better execution by this means. The same thing is, of course, true to an even greater extent in Lyons, France, where the city government maintains a large museum devoted entirely to the textile art of all nations and of all periods in order that the workmen in the silk factories may understand fully the development of the art to which they are devoting themselves.

In planning, therefore, the division of space in a museum, the committee should always arrange for exhibits of interest to the local industries. In addition there must, of course, be a collection for cultural purposes, which should mean material covering the history of art in all periods and all countries. A collection of reproductions is of inestimable value in the teaching of the history of art. Few museums can hope to possess fine examples of Egyptian, Greek, Roman, Gothic and Renaissance sculpture. At present the supply of originals is limited not only by the small number which are being found, but also by the laws forbidding the exportation of works of art. Casts must be shown by themselves and plainly marked "plaster cast from the original in . . ." Repro-

ductions shown with the originals are always confusing, and clarity must be maintained in a museum. It is unfortunate that it is not possible to obtain equally successful reproductions of paintings. A collection of photographs is of inestimable value to the director and staff in a museum, but gives so little idea to the ordinary layman that the exhibition of photographs is a questionable means of education. Their use in lectures is, of course, an entirely different matter. Excellent reproductions of gold and silver finds have been made by the electrolytic method in a number of museums and by several well-known firms in Germany and elsewhere. One of the most complete installations for the reproduction of these objects may be found at the museum of St. Germain near Paris. This museum is especially rich in prehistoric and archæological material and has produced some very remarkable replicas of bronze and silver and gold objects in its collection.

Most people in thinking of an art museum have in mind a picture gallery, and the museum director who only collects minor arts or sculpture would be very unpopular; on the other hand, it is not well for the public to forget that all art is not painting and good collections of the other classes of material are essential.

The difficulty of selecting from a mass of

modern paintings the ones which will be considered worthy of a place in a museum fifty years hence is extreme. It is unfortunate that we are biased in our views by temperament and by fashion. It is impossible to say in what fashion consists, and why we idolize an artist to-day whom we shall have forgotten after a generation. At the time that Whistler's portrait of his mother was exhibited in Paris, the picture received little commendation, and now the picture which won first prize in the Salon that year is considered a worthless daub in comparison. When we look back over the pictures that have made a great success and have been much talked about during the last twenty-five years, we are amazed to find how few of them we to-day consider worthy of a place in a museum. Examples could be multiplied indefinitely. The most popular picture at the World's Fair in Chicago in 1893, "Breaking Home Ties," hardly won a glance at the San Francisco exhibition in 1915. Some one has well said that the buying of modern pictures for exhibition in a museum is gambling with public funds. It is a hazard which the museum director need not take, as a collection of paintings can be rapidly built up by gift and bequest, and the wise director will therefore spend his available funds on old and well-tried masters. But if the

museum director is going to collect modern pictures, why should he not with equal right collect modern furniture of artistic design or modern glass or modern porcelain or any other thing of modern manufacture which has artistic merit? In speaking of the collections which should be made for the use of the artisan, we must not forget that his inspiration will come not only from the work that has been done in the past but equally from the best work that is being done at present. Just as it is necessary for the painter to keep up with the times by going to the annual exhibitions of the Academy of Design, or the Academy of Fine Arts, or by seeing a selection of the pictures shown, so the artisan should keep abreast of the work done not only in this country but abroad in the same field as his own. In this there is the same difficulty that we find in making the selection of modern paintings. What are we going to consider good and what are we going to consider poor fifty years from now? Very often the museum director will find that it will be possible for him to arrange for transient exhibitions of minor arts in the same way that he arranges for transient exhibitions of paintings, and where it is possible, it obviates the difficulty which arises from buying modern art objects.

The innovation introduced by Bode in the old

A SUCCESSFUL "PERIOD" ROOM IN AMERICA. COLONIAL KITCHEN,
OAKLAND PUBLIC MUSEUM, OAKLAND, CALIFORNIA

days before the building of the Kaiser Friedrich Museum, when Renaissance art was represented in Berlin by a room in the Altes Museum, is one which may well be copied in the present time. In that room were arranged paintings, sculpture, furniture, rugs, tapestries, and works of minor art; the one point in common being the period in which the objects were produced. The effect of this room was charming and may well be imitated. It is never under any circumstances, however, justifiable to treat an object of art and one worthy of a place in a museum as though it were a part of the decoration of the museum. It may by its nature be a decoration to the room, but it must be so arranged that for light and for space and for general effect it is shown to its best advantage. To cut a piece of sculpture, a painting or a tapestry, as a layman might do, to make it fit a given spot in a museum is to commit a crime. For instance, in a well-known European museum where a wooden figure was put for artistic effect into a corner in which it did not fit and cut to fit that place, the museum authorities were, to put it strongly, criminally culpable.

A collection, therefore, for cultural purposes should contain, as we have said above, casts of the finest sculpture of the different periods not shown in rooms where there are originals, and

period rooms or rooms in which the different arts produced are shown in their relation to one another, and picture galleries containing such pictures as will not fit in with the arrangement of the rooms by period. There should be, in addition, study series and ample quarters for special collections like prints and textiles which will not be exhibited continuously.

See "Die Museen als Volksbildungsstätten"; the report of the Mannheim Conference of Museum Directors, Berlin, Carl Heymanns Verlag, 1904; K. Koetschau, Museumswesen und Kunstförderung, Jahrbuch der bildenden Kunst, 1903, p. 93.

CHAPTER V

The Preparation of Objects for Exhibition

PAINTINGS

IT has unfortunately been the custom for many years to consider that the restoration and cleaning of paintings could be entrusted to any artist. As a matter of fact, the art of the restorer is as different as possible from the art of the maker of a picture. On this subject we shall attempt to sketch briefly some of the methods used, but the details given will not be sufficient to enable any one to follow any of the processes. There are numerous treatises on the subject but none can be recommended without exception. The cleaning of a painting which needs to be done from time to time should never be entrusted to any but a skilled workman. There are various processes. One restorer insists that the only way to clean a painting is to use the fingers, rubbing gently, without any medium. Others believe in the use of cold water and a sponge, while others hold that certain kinds of oil are advis-

able. Others subject the pictures to the fumes of pure alcohol, the Pettenkofer system, which brings out the colors in a most astonishing way. But the question of the method to be used is not nearly as important as the question of the ability and character of the restorer.

We have, unfortunately, learned from England a love of varnish which would have made most of the old masters turn in their graves. The dealers say: "We can not sell a picture unless it has a good heavy varnish on it. People like the old look that comes by using a heavy yellow-toned varnish." But this is wrong and we must develop the taste of the public in our museums by showing them pictures with only a thin coat of varnish, just sufficient to keep the paint intact as was originally intended. The danger in removing varnish is, of course, that the glazes may also be removed.

At a certain period in the XVIII and XIX centuries, a great deal of pernicious repainting was done under the name of restoration, and pictures which underwent a thorough overhauling at that time are almost unrecognizable in some cases. The stories that one hears of the remarkable discoveries that have been made of Raphaels and other famous masters hidden away beneath the paint put on by the restorer are as thrilling

as any Arabian Nights' tale and probably no layman buys a rather poor picture cheaply without feeling sure that he has an old master disguised. The difficulty in making a restoration is that the restorer, unless he be very conscientious, is carried beyond his original intention to such an extent that it is almost impossible for him not to put in a good deal of his own work on the picture. A careful and conscientious restorer will, however, add nothing to the picture. If there are certain portions lacking, it is the duty of the restorer, as at present understood, to add merely flat color in the place where the paint is gone which will harmonize with the ancient painting but which will deceive no one. In our climate there is often a great deal of trouble from blisters where the paint rises up and starts to peel. The process of getting the paint back into position again is a very painstaking and laborious one. The usual way is to inject mastic under the blister with a hypodermic syringe and then lay the paint back in place very gently, covering it with a heavy weight until the mastic has set, in order firmly to fix the paint in place. Frequently, however, where the paint is cracked and is peeling in many places, the mastic is dabbed onto the face of the picture, trusting to luck that some of it will get into the cracks and hold the

paint in place. In this case, it is usual to place a thin tissue paper over the part that has been so treated until the mastic has thoroughly dried. A little cold water will easily remove the paper and the superfluous mastic.

Where a picture is in a serious condition, it is often necessary to re-back it. In the case of a painting on canvas this is rather a simple matter. A thin tissue paper or muslin is pasted to the front of the picture, the canvas is then taken off the stretcher and laid face down on a marble-topped table. The old canvas is carefully removed and the paint thoroughly wet with a rich mastic solution and a new canvas is carefully placed over this. In order to make the new canvas lie absolutely smooth, a warm iron is applied by some restorers. The process is a delicate one, as the new canvas must show no unevenness whatever yet the heat of the iron may do irreparable damage. When this operation has been completed, the new canvas bears the brunt of stretching over the new stretcher.

Where the painting is on panel, the process is a much more difficult one, as it usually entails the transfer of the painting onto canvas. Tissue paper or muslin is put upon the front of the painting as before. The virtue in this is that the paint is held in place by the tissue paper and no little

particles are lost through friction while the panel is being reduced. The next process is to reduce the panel by planing it down on the back. This process is a very delicate one as, unless it is very carefully done, when the wood has become thin the gesso on which the painting has been applied will crack and separate. The usual custom is to shave the wood down until there is hardly more than a paper thickness of wood at the back of the gesso. Upon this is applied the strong mastic and the canvas is laid down as in the case of re-backing a painting on canvas. When this has been done, there is always a little thick edge which may be seen when the painting is out of the frame which will indicate its history. Frequently, however, paintings on panel, especially in the northern countries like Germany, England and the United States, contract and expand with the changes in the weather. This often means that the face of the picture will crack open. When there is any danger of this, but the condition is not sufficiently serious to call for re-backing, a process known in English as cradling has been invented. This is called in other countries by the French name parquetting. In this process the wooden panel is somewhat thinned by planing on the back. It is then treated with a varnish which is supposed to render it impervious

to worms, and narrow strips of wood are glued onto the back running in the same direction as the grain of the wood. In these strips, which are usually about three-quarters of an inch wide and about two inches apart, grooves are cut at intervals of two inches and through these grooves are run strips of wood of the same width as the first and at right angles to them. These second strips must always be loose; the idea being that if the wooden framework on the back is too rigid, the picture will spread all the more, but where the framework gives as the wood in front moves, there is less danger. This process has been perfected by a number of high-class restorers and has now gained favor almost everywhere. There are still, however, a few men who feel that the only way to treat a wooden picture is to hold it absolutely rigid by the use of iron bars. These iron bars are screwed and clamped onto the wood in such a way that the picture is much more prone to crack than it was before. Over these irons a thick cement supposed to be waterproof is sometimes applied with the intention of keeping all air and moisture from the wood.

The method for the transfer of frescoes to canvas is an exceedingly interesting one and very difficult to perform. It is always a question how much one is going to get in removing a fresco

from the wall, but the most successful method is the following: a canvas thickly spread with a strong adhesive is laid on the face of the fresco. When this substance has thoroughly dried the canvas is torn away from the wall and a surface varying from 1/16 inch to 1/4 inch is pulled off with the canvas. This is then levelled somewhat on the back and another canvas covered with mastic is very carefully laid over the back. When this has been put in place and has thoroughly dried the whole fresco is turned over and heat is applied to the front side to soften the glue. The canvas is then gently removed and the glue is wiped off. When the back canvas has been allowed to stay until the glue has thoroughly set it can be mounted upon a frame just like any ordinary picture. The curious thing about the process is that while the fresco appears on the canvas in almost as good preservation as when it was on the wall, the wall from which the fresco has been torn retains a shadow of the picture sometimes almost as clear as the original although, of course, uneven in surface. (A good example of this is the representation of St. Catherine, by Luini, in the Church of the Pelucca. The original is now in the Brera in Milan, while the wall of the chapel from which it was taken still shows a ghostly shadow of its former glory.)

The other method of removing frescoes is one which has been used largely in Pompeii and other places where classical remains have been uncovered. A wooden frame is made in which the whole section of wall is fastened. The superfluous thickness at the back is then chopped away. This process necessitates the tearing down of the walls on which the frescoes have been painted and is, therefore, impractical in many instances. Any discussion of methods is idle, however, for no museum director has a right to experiment with the objects in his charge. Pictures in need of repairs should be entrusted only to skilled and conscientious experts with whom rests the choice of the method to be pursued.

FRAMING.—This is one of the most interesting problems which comes up in the arrangement of pictures. In the case of old paintings, modern opinion holds that the frame should be expressive of the period in which the painting was made. Many old frames have come down to us, although the museum director who starts out with the hope of providing his old pictures with frames of the period must expect to pay very nearly as much for the frame as he does for the picture, as any authentic old frame commands an enormously high price. In Europe where the museums have been established for so

many years, the museum director is often able to find, tucked away in the attic of his museum, some admirable old frames which were taken off during the period when it was considered stylish for all the pictures in a museum to be framed alike. The falsification of frames is one of the most successful trades, and a fake frame is often so admirable in workmanship that even the greatest connoisseurs are deceived. For these, in many cases, old wood is used and the tricks of shooting buckshot into it to imitate worm holes and collecting dust to rub into the crevices are so cleverly used as to deceive even the expert. In the Brera in Milan are some excellent frames which look very old. In answer to a question as to whether they were expensive, the director said: "Oh no! I had those made in Florence last year, but I told the workman he could leave out the worm holes." Florence has one of the greatest manufactories of imitation old frames, and the market has been so thoroughly cleared of authentic originals that one may feel pretty skeptical as to whether any frames coming from Florence now can be really old. In Munich, in the Alte Pinakothek, are some very charming adaptations of old designs. These are simple, but set off the pictures far better than any modern frame could do. Nothing makes more difference in the

looks of a picture than the way it is framed. The frame is not merely necessary to separate the picture from the background on which it hangs, but is very essentially a part of the impression it gives. Thus, for instance, a Renaissance frame which would be excellent on a picture by Botticelli, let us say, would probably not fit a picture by Rubens. In any period the frame that was used at that time represents the feeling of the age and is much better adapted to paintings of the epoch than is the frame of any other period. Modern artists are turning more and more to the style of frames used in the early Renaissance and adapting types of ancient mouldings to their own pictures. Yet rarely do these express artistic merit and the individuality of the artist to the same degree as do frames which follow the dictates of modern design. The excellence of the old designs was due to the fact that the artist was willing to spend infinite pains to make the frame suit the picture. Modern artists are realizing this and many of them now design their own frames.

The day of heavy gold frames for every picture is past. The frame must now be proportioned to the size of the picture and must conform in tone to the combination of colors in the painting. In the case of old Dutch masters, we note from

the study of contemporary interiors that they were sometimes framed in black or very dark brown, with perhaps a slight touch of gold. A whole room in which the frames are black gives a very lugubrious appearance. For museum purposes the black frame is an admirable note provided it is not introduced too often.

HANGING.—In the matter of hanging, there are many things to be considered. The museum director who finds himself at the head of a museum in which all the walls are plaster is constrained to hang from a moulding or pipe. Of course an ordinary wooden moulding is not strong enough to be considered in an art museum, where very often the pictures to be hung are excessively heavy. Some type of iron bar is the most useful. There are on the market various forms of bars. The so-called Z-bar, one-half of which is imbedded in the plaster of the wall, has the disadvantage that it projects nearly an inch from the surface of the wall when in place and, therefore, the wires or chains from which the pictures are suspended do not hang flat on the wall. The pipe moulding has the same disadvantage, and also, as it is attached to the wall at frequent intervals with fasteners which are sunk deep into the plaster, a hook can not be placed where these fasteners come; therefore the exact spacing of pictures

becomes more difficult. A system used in some places has certain advantages. A slot in the wall at a convenient hanging level is arranged. This slot is composed of two metal bars or two angle-irons let into the wall in such a way that one side is flush with the wall and they come together leaving a slot about ½ inch wide. Metal hooks are provided with a bar on the back. These hooks when turned can be pushed through the slot and when in place hold firmly against the metal edge of the angle-iron. With this system it is possible to hang the pictures very close against the wall and then there remains only the slot, which makes a somewhat disagreeable line around the wall. This same system, however, when used at the height of the ordinary moulding is not objectionable. In some museums where the walls are plastered, a wooden board about 3 inches wide has been let into the wall and painted the same color as the plaster. In this way pictures can be put up with nails or screws as desired, which is obviously an advantage, especially where collections have to be changed very frequently, when much time is saved.

In hanging pictures from mouldings, there are several processes which can be used. One frequently seen in European museums consists of using an iron about 1½ inches wide and per-

forated throughout its length, which hangs from the moulding and to which the pictures are attached by means of a screw which passes through a hole in the bar. This process holds the picture rigidly in place but is very ugly, and the wide iron strips hanging at regular intervals give one a disagreeable impression, even when they are painted the same color as the wall, for they always hang out far enough from the wall so that a shadow is cast on either side which makes a distinct line up and down. Chains have this same disadvantage and also another, in that it is difficult to make a picture hang straight on the two sides, although it is a great convenience to be able to hang the pictures from the floor instead of from a high ladder. The chains, however, have to be especially made for museum work and can not be obtained on the market in America. Much the most attractive way of hanging pictures from a moulding is with the use of an ordinary picture wire. Copper wire can only be used once without becoming much twisted and it is liable to break if allowed to hang bent. The ordinary brass wire has the disadvantage of being very susceptible to atmospheric conditions, rusts and becomes weak very easily. The strongest of the picture wires on the market is the braided steel, the ordinary picture wire, which can be had

in all sizes according to the weight of the pictures it is to carry. The most convenient way of hanging when using wire is to pass one end through both screw eyes on the back of the picture, fasten this end to a hook and hang the hook on the moulding and then raise the picture to its place and fasten the other end of the wire onto another hook. The advantage of this is that only one wire passes from the hook down through the screw eyes and up to the other hook. In this way, if the picture is slightly crooked, it can easily be set straight. The usual way of hanging with wire is to fasten the wire onto the screw eye instead of onto the hook, which makes the adjustment of the picture very difficult. The wires when in place can be tinted with water color to match the wall. If this is done they are quite inconspicuous. All picture wires should be examined from time to time to make sure they have not rusted.

By far the easiest method of attaching pictures to the wall is by nails or screws, where the walls are sheathed with wood and covered with a textile. A room can be hung in about half the time that it takes with any other method, as long ladders are not needed and, once the height is established at which one wishes a picture to hang, to drive the nails only remains. The sheathing of walls

with wood is now considered perfectly safe provided an asbestos paper covering is used or the wood is treated with a fire-proofing liquid, though the chemical properties of this liquid must be tested, as the acid fumes may prove deleterious to the paintings hung upon the wall.

The director is faced by a double problem in any building where there is danger of fire, for it must be possible to rapidly detach the pictures from the wall and yet the frequent attempts to steal objects from museums and exhibitions make it desirable that everything should be fastened in as rigid a way as possible. In one museum, the picture gallery is on the top floor of a none too fire-proof building. The Trustees of the Museum gave directions that all pictures should be so arranged that they might easily be taken out in case of fire, and then they came one day and playfully took down picture after picture and moved them into another room in the gallery in order to give the poor director a shock and to show him how easily a thief might carry off a full collection. Such cases must be dealt with by the ingenuity of the individual museum director. There are certain devices employed, especially in European museums, to put up small pictures and prints. A screw which requires a patent screw-driver is used. This screw is provided with two small

holes on either side of the head, into which the instrument fits, but every one realizes that a strong wire hairpin would be quite sufficient to take the place of the patented instrument that is supposed to be used with these screws. In European galleries where the light is not uniformly good, it is the custom to hang paintings of special importance on long hinges. By this means they may be turned out on an angle with the light. A room in which there are several pictures so hung has a rather untidy appearance, but the improvement in the lighting of the pictures is worth it. The backs should always be covered if the pictures are hung in this way.

LABELLING.—This is another matter which should engage the attention of a museum director, and here his real genius will come forth. There is absolutely no logical ground for refusing to label the objects in a museum. The two excuses given for omitting labels are, the revenue to be derived from the sale of catalogues, which is really negligible and which should not be considered by any director who has the interests of the public at heart; and the fact that the average visitor will read the labels and will not stop to look at the objects. If this is ever the case, the visitor would probably find a way to go through the gallery without profit. Unless a visitor is really interested, he

will not bother to read the labels at all. The casual tourist who feels that he must "do" the museums of a town will rush through, glancing hastily from left to right and from right to left and paying little attention to any of the exhibits. If, however, his eye catches something which he thinks may interest him, he will stop and look at the label where he would not consider for a minute looking up the object in a catalogue. In the labelling of paintings, two points are to be considered: 1. the label should be legible, 2. it should not obtrude itself upon the view of the visitor. How is it possible to reconcile these two? In the museum of the Corsini Palace in Rome, an experiment has been tried which is not altogether successful. Here the labels have been made of wood, rather large, carved in a design resembling the frame and characteristic of the period of the picture. They have been gilded and toned to match exactly the color of the frames. Upon these the name of the picture and the artist's name and his dates have been written in letters characteristic of the period. The result is that in some instances the label is almost unreadable and in other cases it seems to overshadow the picture in importance. The usual brass plates lettered in black while not pretty are certainly preferable to these. In other museums the attempt has been made to have the

lettering not too prominent and the consequence is that one has to strain one's eyes in order to read the label. Perhaps the most successful method is that adopted in the Alte Pinakothek in Munich. Here the label is printed on a long narrow strip of gold cardboard toned to match the frame and placed on the lower part in such a way that the strip runs the full length, and wherever possible, lies on a flat member of the frame itself. These labels are usually about ¾ inch high and the letters are ½ inch in height; the subject matter being very concisely put, giving the name of the artist, his dates or school, and a short title for the picture. Further details are left for the catalogue. One very important point to be considered in labelling is the desirability of having the information as concise as possible and having it all on one label. To have the name of the artist, his dates, and the name of the picture on one label, the name of the donor on another, and the catalogue number on a third, is a very common and disagreeable error. Everything should be done to avoid spottiness in appearance. Each additional bit of brass or cardboard added to a frame detracts from the continuity of the impression given by the picture.

Glass in front of a painting should be avoided

if possible, because of the reflection. In certain cities the dust is so great that glass must be used on all pictures, while a few old masters and small and finely painted pictures always need the protection afforded by glass. If the glass is to be placed in the frame, however, care should be taken to allow the air to circulate between the painting and the glass, as otherwise the process known as sweating, which is very injurious to the surface of the painting, may take place. In a carefully framed picture where the back is sealed so as to keep the dust from the canvas there should be small holes for ventilation in the side of the frame. These may be covered on the inside with cheese-cloth or stuffed with cotton wool to keep out the dust. If a painting is in a precarious condition it is sometimes put in an air-tight case with glass front. This case is usually made the exact size of the picture and just deep enough to allow for the frame. The glass when placed in this way four or five inches from the face of the picture does not reflect as badly as when close to the painting.

MINOR ARTS

The largest group of material available for exhibition in an art museum and one which in this country is, alas, often neglected is that which

may be classified as Industrial Art, and which includes furniture, textiles, glass, porcelain, iron work, wood carving and all the other objects of artistic workmanship which surround us in our daily life. Europe has already recognized the vital interest of collections of this kind and Berlin, Paris, Munich and London delight us with exhibitions worthy of all praise, which develop the taste of the ordinary public in matters connected with home life and are an inspiration to the artisan to produce useful objects of real artistic merit. The importance of such collections can scarcely be overestimated and the museum director will do well to perfect himself in a knowledge of the care of such material, as the public demand is daily increasing and in future no museum will be complete without large groups of industrial art.

Every object that can be preserved in a museum is subject to some kind of pest or disease which requires the care of a skilful physician. Some of these maladies are infectious, others are dangerous only to the object attacked. It is not within the scope of this volume to describe all, nor is it even possible to discuss all the methods of curing the diseases. As in the case of the restoration of paintings, there are experts who have devoted their lives to these things to whom inquiry should

be addressed in all serious cases. The literature on this subject is scattered in the form of articles in Museumskunde, the Museums Journal and the Proceedings of the American Association of Museums. The most complete and authoritative handbook is that by Dr. Fr. Rathgen, "The Preservation of Antiquities," translated by George A. and Harold A. Auden and published by the Cambridge University Press, 1905.

TEXTILES.—Let us consider first the care of textiles, and primarily tapestries. Every woven fabric which contains wool is subject to the housekeeper's pest of moths. Exhaustive experiments, especially by scientists working with ethnographical material, have demonstrated that the ordinary moth balls or camphor balls are of absolutely no use. Cleanliness is most important. There is also a system of disinfection which is very useful. It is well known that the fumes of carbon disulphide kill all animal life and even destroy the germs in insect eggs. This substance is highly poisonous to human beings and is also excessively explosive. It has, however, no chemically deleterious effect upon color or upon the fabric itself. The problem is to subject the textiles to the fumes of carbon disulphide for a sufficient length of time to kill all insects or eggs without running the risk of fire and without poisoning the

operator. One of our American museums has built a vault, just outside the building proper, which is so constructed as to be as airtight as possible. In this the tapestries are sealed for a week at a time, a small saucer of carbon disulphide being placed in the cell with them. This vault was doubtless almost as expensive to construct as the far more efficient device used in the Swedish museums and in Dresden. [See Museumskunde, vol. IV, p. 77, and Museums Journal, vol. IV, p. 205; also Dr. A. B. Meyer, Bericht über neue Einrichtungen in Dresden (1903), p. 22.] This consists of a large metal cylinder about four feet across and eight feet long with a door at one end which can be clamped on in such a way as to make the receptacle airtight. Within the chamber are racks upon which the tapestries or other articles to be disinfected can be laid. A pump supplied with a gauge makes it possible to create a complete vacuum. When this has been obtained the carbon disulphide fumes are introduced and allowed to remain for twenty-four or forty-eight hours according to the condition of the objects to be cured. At the end of this time the carbon disulphide fumes can be pumped out and fresh air admitted until the pressure in the chamber equals that of the room, when the door can be opened and the tapestries re-

moved. This process is the safest both for the operator and for the objects, as well as the most thorough. In certain cases where for any reason it is deemed inadvisable to use the chemical fumes, the vacuum itself if sufficiently protracted is said to have a similar effect. In one of the best known European museums there is a large collection of peasant costumes. These are kept in sealed cases, yet, even so, the danger from moths is so great that the garments are periodically painted over with a strong solution of arsenic, and the guard who patrols the room often shows symptoms of arsenic poisoning. The life of the garments themselves and the health of those in charge of the collection would be greatly improved could the museum install such a vacuum system as that described above. Another preventive of moths which is sometimes used is newspaper. It does not affect the eggs and is only useful if the object to be cared for can be completely covered. In case rugs, tapestries or textiles are to be put away for a long time they should be rolled on a wooden stick with newspapers between and finally done up thoroughly in more newspapers. The moths dislike printers' ink and will keep away from it.

It is unfortunate that we cannot always allow tapestries to be hung on our museum walls in the

manner in which they ornamented some baronial hall in ancient times. But even the most durable fabric has its weaknesses, and a tapestry will collect dust in the folds and will soon show signs of wear in those spots where the dust has lain. It is therefore now no longer considered good museum practice to hang a tapestry from a rod or from hooks,—it must be put on a stretcher, as is done with a painting, so that there shall not be an unequal pull on the threads and if, as often happens, the tapestry is not quite square, then the framework must be made to fit exactly, so that there may be no strain in any point, although sometimes the tapestry itself can be straightened with care. If the tapestry is old or valuable a linen backing is often advisable, and this for two reasons. In the first place, if properly put on, it relieves the strain on the threads of the tapestry, and in the second place, it prevents the dust from accumulating on the threads at the back. In choosing linen for a backing a fine close weave is important and a sufficiently heavy quality so that it will bear the weight put upon it. The linen should be shrunk before using. It should be sewed firmly to the warp threads of the tapestry taking care that there is no slack. In case there are weak places in the tapestry itself these can be caught onto the back thus relieving the strain.

It is much better and safer to completely back a tapestry than to reinforce it with a lattice work of strips of linen as is sometimes done. Before leaving this subject, a word of warning is perhaps not amiss. Never buy a tapestry without seeing the back of it. The forging of tapestries is a very difficult and expensive process which is rarely indulged in, but the unscrupulous merchant will acquire a few torn and tattered fragments and will have them pieced together with great skill. On the back the difference in technique and in the quality of the thread is apparent.

Where there is a large amount of dust in the atmosphere of a city it is often advisable to cover the tapestries with glass. This is an unfortunate expedient because of the reflection in the glass and because of the expense, weight, and the difficulty of handling large sheets of plate glass. But the greatest danger comes from moths, who find a safe harbor behind the glass. Glazed tapestries should be frequently aired and examined for this reason.

There are numerous methods of cleaning textiles. (See Carlotta Brinckmann: Die Instandsetzung der Raffael Teppiche, Museumskunde, vol. I, p. 34; Die Behandlung Koptischer Stoffe, Museumskunde, vol. II, p. 150. Böttiger and Köhler, Uber die Pflege gewirkter Teppiche, Museums-

kunde, vol. III, p. 205. Jules Guiffrey, La Conservation et la Réparation des Tapisseries, L'Art, vol. LX, pt. 2, 1901, p. 341.) The Gobelins method is a bath of running cold water, but while the dyes used in making the old tapestries were marvellous, yet by this process a small amount of color is unquestionably lost. A much safer method is the use of bread crumbs and a soft brush. This is long and laborious but safer than the above. Certain up-to-date directors have tried to use a vacuum cleaner, but where they have done so it has been found that the friction and the pull of a strong cleaner took away small particles of the wool of the tapestry itself. The safest way is to use a hand machine. A cheese-cloth placed over the face of the tapestry will bear the friction and yet be open enough in weave to allow the dust particles to pass through. These same processes may be used for the care of brocades, velvets and other textiles.

Banners or flags that are in a delicate condition may be shown with safety if mounted between two layers of cotton net such as is used in ladies' dresses. The degree of decrepitude will indicate the quality of net to be used. The coarser the mesh the less prominently it will show. A very important and very badly worn flag can be mounted between layers of fine, thin chiffon. This

fabric comes in different weights, that called mousseline de soie (*not* silk muslin) being the best adapted for the purpose. When mounted, the banners should always be hung horizontally so as to avoid folds; hung obliquely they are much more picturesque but they give out sooner.

The care of laces is very simple. Dirt is here again to be avoided, for the small brown spots that so often come on old lace are due to dirt which has gradually rotted the fabric. Many kinds of lace lose much of their character if they have been washed, and yet the museum which allows dirty lace to come into its collection is laying seeds of trouble. There is an infection from dirt as from other diseases, and rotting of some of the finest pieces may result. Lace may be washed with little danger if carefully done. Only the purest of white soap should be used, and this should be grated and dissolved in water. The lace to be washed should be put into a clean white porcelain bowl and covered with cold water. A small amount of the soap solution should be added and the bowl set in a moderate oven until the water is thoroughly hot, not boiling. The gradual warming of the water dissolves the dirt without rubbing or injuring the delicate threads of the lace itself. When it is just too hot to handle take it out and allow to cool slightly, then trans-

fer the lace into another bowl containing clean water of the same temperature and rinse the lace thoroughly by stirring it around well. If the lace is very dirty this process will have to be repeated several times; warming the rinsing water on the lace in the oven is also very helpful. Care should be taken not to break any threads, as the lace when wet is quite heavy and must be lifted so that no strain comes on any part. If the lace is very yellow it may be bleached by setting in water in a jar in the sun, although if the lace is clean the yellow color will do no harm. The most difficult process is the drying. When the lace is thoroughly rinsed it should be pressed between the palms of the hands to get rid of superfluous water and then picked out with the greatest care and infinite patience and laid out upon a clean white cloth fastened to a pillow. Tiny pins with very sharp points can be used to stretch it into place on the pillow and every part of the design must be worked into shape with the fingers. A woman used to handling lace is very clever at this and the piece when finished often looks quite like new. The use of a hot iron is highly inadvisable.

Folds in tapestry, lace or any other fabric must be guarded against as far as possible. If this cannot be helped the position of the crease should

be changed from time to time to avoid wear. The museum director of to-day provides for his laces screens of uniform size which fit a storage case. The frames are made of quarter-inch stock about an inch and a half wide and covered with a textile. The size is determined by the size of the storage case, usually about 18x24 inches. Certain museums use a linen, either blue or unbleached, while others prefer a pongee or thin silk to cover these frames. It is important, of course, that the color should be fast and that it should be one that will show the laces to advantage. Usually these frames fit a show case so that an exhibition of laces is easily and quickly arranged. The laces are basted to the cloth on the frame with small stitches at fairly long intervals and with very fine thread. They must always be put on the inside of the frame so that the wooden edge acts as a protection. This also has the advantage of making a frame for the textile at the time of exhibition.

Linens and embroideries are usually kept in drawers. Tissue paper, preferably blue, as the bleach used in the white is harmful, laid between, is valuable in preventing rubbing and also helps keep gold and silver threads in embroidery from tarnishing. White beeswax put in with white satin is said to prevent its turning yellow. Small pieces

of textile fabrics are usually mounted on frames in the same manner as the laces. Larger pieces are stored in large flat trays or drawers.

Storage cases need not be beautiful, but it is very important that they should be dust proof. Wooden cases are much easier to handle and wooden trays are less likely to buckle under weight than iron or steel ones. As far as fireproof qualities are concerned there is not much to choose, for while the wood will burn, the iron conducts the heat to such an extent that the contents of an iron case are very likely to become charred if exposed to excessive heat.

WOODEN OBJECTS.—Under this head may be included all articles of furniture, wood carving, panelling, wooden chests and even sculptures in wood. All are subject to the same disease and to the same treatment. The pest which commonly attacks wood is the little worm whose tracks may be found in all old pieces and whose living presence may be detected by the little particles of wood that drop from the hole in which the worm works. A light tapping near a suspected spot usually brings out the particles of sawdust and then the piece must be quickly isolated and treated, to prevent the pest spreading to nearby objects. If this is not done, a whole room is likely to become infected in a very short time. In the case of

small objects an operation similar to that used in the treatment of tapestries is followed. A box is made of zinc carefully soldered together at the sides so as to be perfectly tight. Around the top a gutter is arranged, while inside is a wooden rack raised a few inches from the bottom of the box. A cover is provided which fits down into the gutter at the top of the box. A saucer of carbon disulphide is set in, the rack put in place with the object to be disinfected upon it, and the cover is put on. Then water is poured into the gutter so that no air can penetrate the box. This forms a fairly tight chamber in which the object to be disinfected must remain from one to two weeks according to its condition. If it is given long enough the eggs as well as the living worms will be destroyed. If the vacuum apparatus described above under textiles is used the time needed for this process is much shorter.

Many museums have used the "petroleum bath" with varying success. It seems to have been demonstrated that to thoroughly soak a piece of furniture in petroleum will kill the worms. The petroleum does not, however, kill the eggs and the process has frequently to be repeated. There are many disadvantages in this. In the first place the petroleum gives a very disagreeable odor in the exhibition galleries; secondly, the object

treated in this manner becomes highly inflammable, and thirdly and most important, the petroleum not only injures any finish there may be on the wood, but darkens the wood itself disagreeably.

A much better and simpler treatment, which can be used without injury to the finish of the object, whether it be the ancient polished surface, or gilding, or polychromy, is the application of cedar oil to the affected parts. This may be put on with a brush in case the area to be treated is large, but when it is possible, a surer method is to inject the oil into the hole itself. So far as has been proved the cedar oil will not injure color, and this method may thus be used not only in caring for polychromed statuettes, but also for paintings on panel.

The care of the gothic polychromed sculpture which is slowly finding its way into our museums is a serious matter. The changes in the degree of humidity in the air, which make the climate in this country so interesting, affect most seriously these lovely objects. The swelling and contracting of the wood loosens the paint, which comes off in little flakes. The process continues even when these particles are back in place and it is sometimes most discouraging to find one's efforts apparently vain. The quality of the adhesive

used and the manner of applying it are of the utmost importance.

Wooden objects which come from excavations often need special treatment. Impregnation with paraffin is one of the simplest things that can be done and is quite efficacious.

IRONWORK.—Under this head it is necessary to make a distinction between the different classes of objects, for while the enemy is the same in every case, the remedy is different.

In the great European collections of armor, a man is kept at work constantly burnishing the pieces in rotation in a manner very similar to that used by his ancestors in preparing the knight for battle. As each piece is freed from rust it is coated with a thin filament of pure oil, not kerosene, for that has been proved to increase rather than diminish rust. Finger marks cause rust quicker than anything else, so that in handling a collection of this kind gloves are necessary. Old locks, keys, etc., may be freed from rust by boiling in water and scraping, and should then be treated with oil to keep them in condition.

Exhaustive experiments have been tried in the chemical laboratory of the Berlin museums. It has been proved that an object once thoroughly freed from rust and not handled will show no signs of returning trouble. The difficulty is, there-

fore, to free it from rust. Taking an iron dagger which came from some excavations near Berlin, Professor Rathgen first removed as much of the rust as was possible in the ordinary way and then used a dentist's buzzer to obliterate all remaining traces. The result was a disagreeable, pock-marked, shiny, shapeless thing which had lost all character by the process. It was so unsatisfactory that no object has ever been exhibited on which the process was used, and the experimenters are trying to discover some means of preserving the "antique look" without risking deterioration. The usual method of securing this result is by painting the object as it comes out of the ground with paraffin or varnish. The theory of this is that rust grows by oxidation and that an object kept away from the air will not become worse. The effect is very ugly, and the object has almost as "false" an appearance as the too much cleaned specimen. There is an electrolytic method which bids fair to prove the solution of the whole problem. The surface rust is partially removed by this and the progress of the disease is at least temporarily arrested. Often iron objects recovered from excavation are in a condition where even their form is threatened because of the corroding action of the rust. In these cases, the varnish or paraffin method is the only satisfactory

one, for the varnish acts as a mastic to hold the pieces together and at the same time by keeping the air out prevents further decomposition.

BRONZES.—Of all objects in our museums the most difficult to care for are bronzes. These, especially such as have been for a long time buried in the earth, are subject to disease. One form of this is highly contagious and likely to be fatal to the object it attacks, and the others, while not communicable, are yet dangerous unless cared for. Should any bronze in a collection show signs of the first of these diseases, it must be isolated at once or all the other objects in the same case are liable to become infected. So far, no cure has been discovered for this disease although its progress may be arrested by placing the object in an air-tight case with pans of calcium chloride in the bottom to absorb any excess moisture in the air of the case. The first sign of the disease comes in pale green spots which gradually grow and spread until the whole surface of the object is covered and a fine green dust falls about it. A paraffin coat holds back the damage and if the case is not bad an electrolytic operation may cure it. The French process is the most satisfactory and simple of any, and will be found fully described in the introduction to the catalogue of Bronzes in the Metropolitan Museum by Gisela

M. A. Richter. The other forms are the so-called "cracking" patina, the warty patina, the scaly patina and the pale blue patina. The most complete and exhaustive study of this subject will be found in the little book called "The Preservation of Antiquities," by Dr. Friedrich Rathgen, mentioned above.

TIN.—The tin disease is another very serious malady which is so far little understood. It comes about through exposing objects containing tin to too great cold and consists in the reduction of the metal tin into the salt tin. The salt cannot, however, be changed back into a metal without bringing the substance to the melting point. It is obvious, therefore, that this would be an impossible method to pursue with museum pieces which are preserved for their shape or modelling. Should the little white particles which denote the presence of the disease appear on any museum piece, care must be taken that the temperature of the room in which the piece is kept should never go below 60° Fahrenheit.

SILVER.—Museum silver can best be cleaned by the use of ammonia, a soft brush, very hot water and a soft chamois skin. A brilliant polish is not desirable. The usual cleaning compounds all scratch the surface more or less.

MUSEUM CASES.—Certain general principles

can be laid down in regard to cases. Beyond these each museum will have to find out by experience what to do and what to avoid.

Some twenty years ago came the first agitation in favor of metal cases. The advocates of these contended that they were: 1. safer in case of fire, 2. more dust-proof, and 3. better adapted for showing objects because the frames were thinner and less conspicuous. The subject has caused much controversy, but the present opinion seems to be that so far as fire danger is concerned one type of exhibition case is as bad as another. A metal case is more expensive to build, but is also more permanently satisfactory in our changeable climate because not subject to the same contraction and expansion experienced by wood. On the other hand, the building of wooden cases has been affected by the design of the metal case and the wooden framework for the glass can now be made as light as is desired and as is proportioned to the size of the case. Cases as well as other museum equipment are now considered more beautiful and suitable if they are without ornament. The plainer and less conspicuous the lines of the case and the finer and quieter the grain of the wood and the finish, the better it fulfils its function in setting forth the objects within. In art museums to-day three types of cases are used,

the wall case (see Morgan collection in Metropolitan), the desk case (see miniature cases, ditto), and the free standing case. The proportions of these cases must be studied in each instance according to the objects they are to contain and the size of the room in which they are to be exhibited. A combination of wood and iron seems to prove most satisfactory in building these cases, and they can be made with all kinds of mechanical devices to facilitate the work of the curator. Thus desk cases are made with finely adjusted weights which work in the legs of the case in such a way that the top will remain open at any desired angle, and free-standing table cases have sliding decks so carefully adjusted that they can be pulled out and pushed in without jarring the objects in the case. Then there is the system in the McLean case, an adaptation of the type developed by Dr. G. E. Pazaurek, Museumskunde, II, 79, where the whole top can be lifted up by means of a crank which works on a series of ratcheted posts which disappear into the legs when the case is closed. It will readily be seen that some of these devices are merely ingenious while others are really useful. (For discussions of these subjects the reader is referred to Dr. A. B. Meyer's Reisestudien and Berichte; Museums Journal, VI, 231, 403, to Dr. Foy's description

of the Rautenstrauch-Joerst Museum of Cologne in Ethnologia, and to the papers by Mr. L. E. Rowe and Mr. H. L. Madison in the proceedings of the American Association of Museums, 1916.)

There are two really important matters to be considered in building cases. One is that they should lock securely, and the second, that they should be dust-proof. For the first of these one must be cautious in the selection of the hardware on a case. A very good type of lock is one which throws three bolts, one at the top of the case, one at the bottom of the case and one in the middle. This has the advantage of holding a large door firmly closed as it could not he held with the ordinary lock. A small keyhole is desirable and a complicated system of tumblers on the order of a yale lock is also an advantage. A large number of keys is to be avoided. Each museum should have its locks made to order with a minimum number of keys or with a master key, and it is desirable that the firm who makes the keys should be located in some other city and should not know for whom they are made.

Dust-proofing may be accomplished in various ways. Perhaps the simplest is that in which the door is provided with a little tongue which fits into a groove in the frame. The groove has to

be made larger than the tongue in order to allow for shrinkage or swelling, but a layer of cotton or linen felt (*never* wool in any form) may be inserted to stop any possible passage of dust. If this is saturated with a disinfectant it is even better in keeping out insects. In metal cases the door is usually made to shut against the frame, and a layer of felt is supposed to be sufficient to keep out dust.

An excellent type of flat, shallow case attached to a wall for the exhibition of prints may be seen in the Fogg Museum, Cambridge. It should be noted that in this case much space is saved by having two doors hung on one specially constructed hinge.

Storage cases for Prints will be discussed under the separate heading of Engravings.

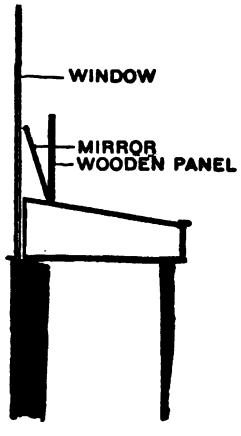
In a number of European museums attempts have been made to build cases which should harmonize in design with the objects they contain. The institution which has carried out this idea most extensively is the National Museum in Munich. Here we find cases designed to harmonize with the Byzantine, the Romanesque, the Gothic, Renaissance, Rococo and even modern periods. Such a procedure is of doubtful usefulness and does not accord with the latest dictates of museum practice. A case is not a part of

HEAVY AND UNSUCCESSFUL CASES DESIGNED IN A "PERIOD,"
BAVARIAN NATIONAL MUSEUM, MUNICH, GERMANY

the exhibit, it is simply a means of housing safely the objects to be shown. A case designed in a period may or may not be successful. If it is, it may add materially to the effectiveness of the room. But that particular case will be useless anywhere else, and if it is not successful it is offensive. Thus in the National Museum in Munich the Byzantine cases and one Rococo case are *excellent*—the Renaissance cases in the Italian room are *very* poor. In the Musée des Arts Décoratifs in Paris in the rooms devoted to modern art it was decided to give the furniture designer an opportunity to try his skill at designing a case which would harmonize in spirit with the modern furniture shown in the room. The result was one of the worst types of cases imaginable which even the authorities of that museum regard as a mistake. The worst feature of it is that it is in no way dust-proof and it is very easy to break into. Both of these matters might be remedied without influencing the design were that good enough to be worth the trouble.

One of the most difficult matters that confronts the director of a museum situated in an old building, crowded for room, is the utilization of the space under the windows. An example of an excellent solution of this problem is to be found in the Ashmolean Museum at Oxford. Here the

windows come quite low in the wall and at rather short intervals so that the exhibition space is much restricted and the glare in the eyes of the visitor is unpleasant. To obviate this, a case has been built partly into the window opening, with a solid



WINDOW CASE IN ASHMOLEAN MUSEUM

back. Above the case and on the inside of the window casing is a wooden panel which keeps the light from shining directly into the face of the visitor. Behind this panel mirrors are arranged which throw the light from the window directly down into the case, thus securing excellent light while at the same time cutting off the glare. The rest of the room is perfectly lighted by the upper part of the window.

RARELY SUCCESSFUL CASE DESIGNED FOR A RICHLY DECORATED ROOM, BAVARIAN NATIONAL MUSEUM, MUNICH, GERMANY

Cases should be made from museum specifications, never from those used by a department store. Experience will soon show how a case should open. The usual wall case with a wide door will need to have some support when open, but it is much easier to arrange such a case than one in which only the narrow ends are made to open. The free-standing high table case which is to have exhibits on four sides is hard to arrange. The McLean system of raising the top has the advantage of giving access to all sides, but unless the top can be raised the entire height of the glass, there is sometimes difficulty with big objects. If the type of case with doors at either end be used, it is convenient to have the bottom of the case made to slide out to permit easier arrangement.

The furniture inside a case and the question of whether the bottom of a desk case should be flat or slope with the glass are matters of individual preference. Glass shelves are usually used, although if there is the slightest vibration in the museum the objects cannot be kept in line if they are standing on glass. Wooden shelves are lovely as a background for many kinds of objects. In wall cases a form of adjustable bracket support is used for the shelves. In free-standing cases small glass columns usually bear the weight of glass shelves when these are used.

If the museum is cramped for space glass shelves must be used because many more objects can be shown with them, but the fact of their transparency makes the effect of the case confusing. The museum visitor sees everything in the case at a glance, and in order to see any individual thing must focus seriously upon it. Where the inside of a case is fitted with wooden shelves in pyramid form this is not the impression and the arrangement in groups is greatly facilitated.

For small objects cases made all of glass without wooden framework are often used. These are best held together with a special kind of cement. Where this cannot be obtained nickeled clamps at the corners may be substituted. Care should be taken that this type of case is not too commercial in design. A glass bell or convex glass corners on a museum case distort the objects within and should never be used.

Storage cases should be of wood rather than metal because, should a fire occur, the metal conducts the heat to such an extent that the contents of a metal case are often charred, whereas if the case were of wood the fire might be controlled before any damage was done to the inside of the case.

LABELLING.—In labelling minor arts the director has much latitude. It is usually customary to place upon the outside of a case a label telling

the general nature of its contents, as, AMERICAN GLASS, XVIII AND EARLY XIX CENTURIES. This is sometimes painted on the case, but if this is done no other material can be exhibited in the case until it has been repainted. The Metropolitan has perfected the printing of glass labels which are very satisfactory for such work. They may be hung inside the case and are legible, unobtrusive and do not obstruct the view of objects in the case. Separate smaller labels harmonizing in tone with the background of the case may be used for individual objects. These should always be placed in a definite relation to what they describe. Black labels printed in gold are not as legible as light-colored ones printed in dark ink. Hand-written labels always look more untidy than printed or hand-painted ones.

Where the objects to be labelled are very small, Egyptian scarabs, gems, coins or the like, and there is much to say about them, numbers beside the objects referring to one central label may be used.

Holders of some kind for labels in cases are often necessary. The most convenient and the simplest are made of wire to exactly fit the label, but if these are not at hand a small block of wood glued to the lower part of the back of the label holds it up nicely.

Where it is desired to affix the label to a marble or wooden base a compound of wax and balsam fir described in the Proceedings of the American Association of Museums, 1915, p. 111 may be used. This does not leave any mark upon either substance and is easily removed if desired. It is used in a number of European museums very successfully.

The subject of labels has been exhaustively discussed at the meetings of the American Association of Museums especially in the years 1910 and 1911, and good authority can be cited for any procedure.

The subject matter on a label should answer the general questions of the visitor and furnish sufficient technical information to interest the scholar.

SCULPTURE

The cleaning of marble sculpture, like the restoring of paintings, should only be undertaken by an expert. Soap should *never* be used on marble, as grease of any kind discolors the surface and gives it a peculiar shiny appearance. Warm water and ammonia can often be used, especially on a polished marble. Experts, however, use a solution of muriatic acid which quickly removes all spots. The trick comes in knowing how strong

it can be used without destroying the surface, and in washing it off afterward. Whiting is sometimes used but with rather unsatisfactory results. Of course, ancient marbles which have acquired a patine from burial in the ground would never be cleaned at all beyond removing the surface dirt with a brush or cloth. Many museums use a feather duster in cleaning. This is a mistake for the little stiff part of the feather is apt to be very scratchy and may do some injury. Much better is a painter's dust brush.

In the matter of the restoration of sculpture, fashion is discouraging more and more any attempts in this direction. It has been said that a statue with a broken nose is much more beautiful than one with perfect features because the imagination can supply an infinitely finer nose than any which an artist could achieve. Be that as it may, the Albertinum in Dresden is setting the example of the ideal way of handling sculpture. Among the many fine marbles this museum possesses, few are in perfect condition; some are Roman copies of Greek works; some could obviously be restored only in one way. Where fragments are present, they are pieced together so far as there is no manner of doubt as to their position. The moment any doubt is felt, a plaster cast is taken of the whole figure and of any parts, and the pieces in

plaster are fitted together according to the idea of the scholar who is working on the problem. This restored cast is then placed on exhibition close to the original and carefully labelled so that the public can easily see which is which. In this way, with any change in opinion the cast can easily be altered without disturbing the original. Photographs of similar figures or groups are also provided for comparison. In the case of Roman copies of Greek works, casts of other copies of the same work are shown, and there is usually some member of the staff at work trying to reconstruct from these various copies the exact appearance of the original. It is only the exceptional collection in this country, however, which is rich enough in this class of material to be faced by this contingency.

When it comes to mounting sculpture, the question of the height of the base on which it is to be shown is of prime importance. (R. F. Martin, Some Notes on the Relationship Existing between Statue and Pedestal in Classical and Renaissance Times, Museums Journal, vol. IV, p. 333.) No definite rule can be set down, as each piece differs from every other. An excellent device is the use of the so-called "tiering machine," a valuable adjunct to any museum. This machine, developed for commercial purposes, is composed of a plat-

form on wheels, which can be raised by means of a crank to any desired height up to seven or eight feet. The crank works very easily, as do the wheels, so that it is quite possible to put your marble upon the platform, drag it to the spot where it is to be exhibited, raise the platform to the height of the pedestal and transfer the object to it. But one of the greatest advantages of this machine is that you can test the height you are going to want for your base. Put the statue on the platform, take it to the place where it is to be exhibited, have an attendant work the crank, raising and lowering the platform till you are sure of the exact spot where it looks the best, take the measurement of that height and then order your pedestal. You will be certain to have no regrets.

Bases for statues may be built of wood, and should be provided with strong casters, so that it will be possible to move them in cleaning without too great difficulty. Marble bases are excessively expensive and rarely an improvement. Should square marble shafts be used for the mounting of busts, however, it is well to remember that the grain of the marble on two sides will show long stripes of color and on the other two sides, tiny flecks. If you desire to make your busts look as though they were higher up, place the

striped side to the front. The other side will look at least two inches lower.

Pedestals for busts are difficult to proportion properly. They must not be too wide at the top or they look clumsy, and if they are too narrow for their height, must be weighted at the bottom so as not to tip over too easily. Small busts can best be shown on brackets. The height is determined by the position of the eyes, which should be on the level with those of the beholder, if the bust is life size. There are exceptions to this rule, however, and the general appearance of the room as well as the size of the bust must be taken into consideration in planning the pedestals.

The latest experiment, which is being tried in the new classical wing of the Metropolitan Museum, is that of casting pedestals in cement to imitate stone. These have all the properties of stone but are cheaper to build and lighter to handle, being hollow internally. They are substantial in appearance. Their durability has, of course, not yet been tested.

CASTS

A collection of reproductions in plaster to supplement original material is desirable. To simply store such a collection as is done in many European museums is a waste of material. Among

the visitors to our museums, there are very few who are studying the history of sculpture so profoundly that a crowded or careless arrangement which would be intelligible to a specialist is of any interest. On the contrary, the purpose of a cast collection is to stimulate enthusiasm in the study of art among all visitors. It is, therefore, essential that an interesting group should be chosen and that it should be well arranged. The same amount of care and money should be spent on the installation of a series of casts as of originals, if the public is to understand and enjoy them. (G. Treu, Die Sammlung der Abgüsse im Albertinum zu Dresden, Archæologischer Anzeiger, 1891, No. 1.)

The first point to be observed is the same in this as in every other class of material,—beware of overcrowding. The museum of comparative sculpture of the Trocadero, admirable as it is in many ways, has this fault. We are faced by an overwhelming quantity of objects all clamoring for our attention simultaneously. A few well-chosen figures illustrate the artistic development sufficiently; the rest should be stored and brought out only for lectures or for diversity.

Perhaps the most discussed point in connection with a cast collection is the desirability or undesirability of coloring the casts to suggest the

material of the original statue. (B. Daun, Die Bemahlung antiker Gipsabgüsse, Museumskunde, XI, p. 193.) In considering this question the preservation of the cast must be thought of. A cast is by nature porous. It catches and holds dust very easily. Unless it has been treated in some manner dust can only be removed by the use of some elaborate method like the starch process, which was developed in the Albertinum in Dresden, the receipt being as follows:

In order to starch a life-size bust, take about one pound of clean, dry wheat starch and pour over it a scant pint of cold water. Stir until lumps are gone and the starch and water are thoroughly mixed. Place on the stove an agateware kettle which holds at least a gallon and put in it about two quarts of boiling water. Add to this the mixture of starch and water already made and stir constantly to avoid lumps. This should be allowed to cook until the paste becomes very thick. This hot paste must be spattered at once onto the cast by means of a large round bristle brush. The plaster must not be stroked with the brush, but the cast must be covered with an even coat of paste about one-half inch thick. If the paste is too thin it will run off, while if it is too thick it will not stick at all. A little experimenting will easily show what consistency is desirable. After

about twelve hours, or at the latest the next morning, if the starch is put on in the afternoon, the paste must be carefully pulled off with the fingers. In general the dirt will be taken off with the paste. Should dirt, however, stick to the cast anywhere, it will be loose and can easily be removed by a gentle wiping with a damp sponge which must be washed and squeezed out in fresh cold water. The starch must not remain on the cast longer than one day, as otherwise it becomes too dry, and in tearing off it takes the plaster too, and thus injures the surface. The same result occurs if the layer of paste which sticks to the cast is too thin.

If large statues or groups are to be cleaned the starch must be prepared in larger quantities and the paste put on beginning at the top. The process must not be interrupted until the whole is covered. Before attempting to apply the starch paste, the cast should be carefully examined to determine whether it has already been treated in any way or whether the plaster is still in the raw state. Casts which have never been treated or those which have been painted with water colors may easily be cleaned by the application of the starch paste. Great care should be taken that the paste is of the right consistency, as otherwise the cast may receive some damage.

There is a way of treating the new cast chem-

ically that is used in the Albertinum in Dresden which is said to make it possible to wash it later when dirty. European museum directors have spent much more time and study on such problems than our American museum men have done. Experiments are being made in Munich with a shellac mixture. But this discolors the cast in a disagreeable manner. In this country some of our older museums are using white water-color paint on the casts when they become too dirty for exhibition otherwise. Such a proceeding makes every student hold up his hands in horror. The spirit of a work of art is such a delicate and evanescent thing that it is only with the greatest difficulty that it can be caught and imprisoned in a cast. Those who know and appreciate the subtleties of modelling call for a cast made from a mould taken directly from the original and prefer an early cast from that mould rather than a late one, so easily are the shades of surface destroyed. Imagine, then, what a lifeless thing a cast becomes when its surface is covered by layer after layer of calcimine! It is for this reason also that the washing of casts is attended with so much difficulty. The slightest change in the surface of a cast impairs its value, and the problem is consequently to provide a method of filling the pores of the plaster that will make it less

subject to dust while in no wise altering its form, and to provide a method of removing dirt without injury to the surface.

If the officers of the museum decide that they wish to exhibit their casts white, there are three methods open to them. The first of these is the Albertinum method, which requires special apparatus that is rather costly but which is thorough and satisfactory. The second is a very simple process as follows: Take a one-quart glass preserve jar with a tight-fitting top and break up in it about two rounds of white beeswax. (This may be obtained by the pound or in five-pound packages from wholesale druggists. It comes in thin, round cakes about five or six inches in diameter and there are about seven or eight cakes to the pound.) Upon the wax in the jar pour a quart of turpentine. Set aside over night. In the morning the wax will be completely dissolved in the turpentine. NO HEAT IS NECESSARY. Should time be short, a workable solution may be obtained in a half hour by breaking up a larger quantity of the wax in half the quanity of turpentine and shaking it thoroughly. Then take a soft, small paint brush and dip it in the solution and apply to the cast. Should the marks of the brush show on the surface, thin the solution with turpentine until it is easy to handle. Care must

be taken not to *rub* the surface with a cloth as it easily takes on a decided polish. If this polish comes, it can be dimmed with clear turpentine. A cast that has been so treated can be washed with cold water and a sponge and, in case the dirt persists, with turpentine on clean cotton waste. After it has been washed, however, it is very desirable that it should be treated again with the turpentine and wax. There is often a certain difference in the quality of the surface of the plaster which does not show if the cast is left untreated but which with the application of any solution causes spots of a grayish color to appear. There is no help for this, although when thoroughly dry the difference is not very marked.

The third process is the application of zapon, with which the author has had no experience.

PATINATING.—The coloring of casts to imitate the material of the original is a process which has been called patinating. It is in use in the Kaiser Friedrich Museum in Berlin, in the Trocadero in Paris and in many other of the fine European cast collections. In this country it has so far been little used and museum officials are still arguing as to the ethics of the procedure. There is no doubt whatever that the impression made upon the public is much more pleasing and also much more true if the casts look something like

the originals in color than if they are a staring white. The method adopted must, of course, be carefully studied, for if, in order to color the cast, a thick white coating of paint is put over it, the museum director will find himself much criticised for destroying the shades of modelling in the surface. Admirable results may be obtained in various ways. Perhaps the most effective of these is the Trocadero system which starts with the wax and turpentine solution to which a small amount of prepared oil color is added according to the shade desired.

Marble.—For the lighter whiter marbles of the XVII and XVIII centuries, the least suspicion of van Dyke brown in the mixture is sufficient. For ancient marbles that have mellowed and yellowed with time, use yellow ochre and van Dyke brown. The liquid will have a strong yellow-brown look.

These mixtures should be applied with a medium-sized brush, and a clean, soft cloth or piece of cotton waste should be at hand to wipe off superfluous color. It should be remembered that the color of the cast will be much less intense when it is on the pedestal and on exhibition than when being worked over in the shop. If too much color is applied, it may be in part removed by washing with turpentine.

Terra Cotta.—Is somewhat more difficult. The Trocadero uses raw Siena and red ochre, but a little experimenting will be necessary before a wholly satisfactory result can be obtained.

Wood.—Yellow ochre, van Dyke brown, raw Siena and black.

Bronze.—A dull brown or green bronze can easily be obtained by using a large proportion of color in the turpentine and wax mixture. Should the gold lights be desired, however, the cast must first be shellaced, then gilded, then shellaced again, and finally painted over with green or brown of the appropriate shade. This method is not to be recommended, because of the numerous coats of paint required.

Basalt.—Black and the least suspicion of green mixed with turpentine and wax, and put on with a small atomizer or other spraying apparatus gives an excellent representation of basalt.

Glazed Terra Cotta.—The glaze of the terra cottas of the Della Robbia sculpture may be admirably imitated by using the turpentine and wax rather thick. This should stand for some three or four days and then be rubbed down and polished with soft, clean cloths. A little zinc white added to the mixture will give a still better color.

Stone.—A very satisfactory process is the following: Dissolve a small amount of sculptors'

clay in water and add a little lampblack. Experiments will soon show the exact proportions necessary, which will vary with the subject. Stir constantly and apply as evenly as possible. In some cases it will be necessary to stipple the surface. This makes a thin coating, easily wiped off, but as the dust settles upon it it becomes daily more stony in appearance. A glue size with boneset has given fair results.

The firm of Gerber and Company of Cologne has made a specialty of coloring their casts, and do it very well for the most part. The suggestion of the original is very clear, although it may be questioned whether their color is accurate in all cases. Inaccuracy may be overlooked if the coloring is not very well done. When it is, it should be like the copy of an oil painting, just as close as a good artist can make it.

MOUNTING.—The "tiering machine," elsewhere described (see p. 158), is very valuable in determining the most desirable height for cast as well as original sculpture pedestals. For large casts, the pedestal should be about two or three inches wider on all sides than the base of the cast. Busts, especially life-size ones with a small base like those of Cæsar, Socrates, etc., should, if possible, be shown upon a small shelf at a height that will bring the eyes at about the level of the

eyes of the average visitor. The usual pedestal is apt to be clumsy if made large enough to be thoroughly steady. Such busts as those of the XVII and XVIII centuries which show more of the figure must, of course, be placed upon a regular base. In this case it is possible to have the width of the base somewhat less than the width of the shoulders of the cast provided that the cast is arranged with the usual small round base below. (See Marie Antoinette, by Lecomte; Lafayette, by Houdon, etc.) When it comes to such casts as the large half-figure of St. Anne from Rheims, which is more than life size, it must be raised higher from the floor, and in this case, unless the pedestal is kept as small as possible, it will look ill-proportioned. The same thing that has been said about design of pedestals elsewhere holds true here. The lines should be as simple as possible. There is no objection to the use of plain pine wood painted, which is often quite as effective as a much more expensive stock. No lumber that has not been well seasoned should be used in pedestals. Casters should be provided in all bases so that the casts can be readily moved about for purposes of cleaning or for instruction. In the Albertinum in Dresden, casts are frequently moved into the lecture room for use in illustrating a course of talks on the history of art.

Bas-reliefs may be fastened to the wall by the use of angle-irons which can be obtained from any blacksmith. The lower edge of the relief is measured and the iron bent to fit. From six to ten inches according to the weight of the cast are allowed in the arm which is to be fastened to the wall. This arm is drilled with three or more holes. The cast is held in place on the wall and the spots where the irons are to go, marked. It is then taken down and holes are drilled in the wall into which the expansion bolts or toggle pins are put, through the iron arm. When these have been securely fastened they may be painted the color of the wall and the cast then placed upon them. A hook put in the wall at the top of the cast may be fastened into the wire eye, usually provided in such objects, to insure greater security. It is sometimes desirable where the relief is deep and heavy, as in the case of some of the gothic figures, to provide a small wooden base to hide the mechanism which holds the cast in place, and to give a greater appearance of stability. The simplest kind of mouldings are the most successful, and the fewer the members in this base, the less conspicuous it is and the easier to keep clean.

LABELLING.—The labelling of a cast collection is most important, for we must remember that in dealing with such material we are educating our

public and teaching them not only to appreciate beauty but also where to look for beauty. The first essential is to give the name or subject; then, equally important, the fact that it is a PLASTER CAST, and, consequently, where the original is, the artist, his country and date. In some cases the original has been removed from the place it was intended to occupy, and in that case this fact should be mentioned as "Original from Corbeil, France, now in the cathedral St. Denis, France."

Holders provided with glass to protect the label are really essential, as the labels on casts seem to become defaced much more rapidly than those on other objects. Here, again, simplicity of design is the most important requisite. A good type is that used by the Metropolitan Museum and by the Minneapolis Institute of Arts. It consists of a narrow frame with square edges provided with a slight projection on two sides for the screws which hold it in place. The label is held firmly within this and can only be removed by taking out the screws.

The color of holder and label should harmonize with the color of the base. The ink used should be black if the label is light in color and white if it is dark. Very dark blue, brown, green or purple ink can sometimes be used with even better effect than black.

PRINTS

The care and installation of a print collection is a subject by itself, requiring an expert knowledge of both museum and library methods. An ordinary print collection contains too many "specimens" to exhibit all of them at once, so that the problems of storage and cataloguing become of greater importance than the problems of exhibition.

Let us consider some of the processes a print goes through on entering a collection. It is first of all identified and entered in the accessions list and given a number. Then it must be stamped on the back in some place where the paper is well covered with ink (i. e. where the stamp will not show through on the right side) with the device of the museum or collection. The Kupferstich Kabinet in Berlin uses a small brass mould into which gelatine is poured to make a die or stamp. The advantage of this over a metal stamp is obvious, for it is soft enough to be used on the thinnest India paper without danger to the print. Rubber stamps may also be used, but a fine type can be made more legible with the gelatine, and as soon as the impression begins to be unsatisfactory the gelatine may be melted over and a fresh die prepared. Great care must be taken in

the selection of the ink, as ordinary inks eat the paper of the print. Windsor and Newton's sepia oil color has been used instead of ink. It is important that the ink should contain no aniline dye and that it should be spread evenly on a glass plate before being used, to avoid lumps and thick spots in the marking. Space is usually left in this stamp where the accessions number can be added in pencil. The custom of using pencil for this purpose seems to be due to the fact that every large print collection expects to be able to sell or exchange duplicates when it acquires a better example of any work. This is not done in any other branch of art museum work though it is more or less customary in scientific museums. The pencilled number can be easily erased and should, of course, be removed before the print leaves the museum's collection.

The next step is the mounting. The Print Department of the British Museum and the Kupferstich Kabinet in Berlin are the two collections that have paid the most attention to this side of the work, and the "British Museum board," a mounting board specially prepared, free from substances harmful to prints, is the standard everywhere. It is, however, very expensive and most of the American collections content themselves with using one of the mounting boards put on the market

by Chas. T. Bainbridge's Sons in Brooklyn. The author has never seen a chemical analysis of this board and cannot vouch for its freedom from injurious substances; in the collections where it has been used, however, it seems as yet to have done no harm. In mounting prints certain uniform sizes are used in most large collections. The advantages are obvious. In the first place, it is much easier and safer to store objects of uniform size; in addition, they are more easily exhibited, whether in separate frames or in a wall or desk case, and in loan exhibitions where prints from other collections are shown they are much more easily handled if all of similar sizes. It has been found convenient to use the following three sizes of mats: 14x18, 22x28 and 28x40. These give good proportions and most prints fit one of these sizes. The usual custom in mounting prints is to hinge together two pieces of board with linen tape or strips of linen cloth especially prepared. An opening is cut in the front board to show the print up to the margin of the plate. The backing board must be fairly thick, so as not to bend easily in handling, and to give real protection to the object mounted upon it. Rubbing is very harmful to the surface of prints, and the front board varies in thickness according to the value and size of the print and the amount of protec-

tion it needs. The opening in the front board should be slightly above the centre, as the eye in looking at a print has a tendency to make it look lower. This opening is usually cut with a bevelled edge. In Berlin a special machine has been made for this and the process is easy and simple. In our smaller collections the bevel is usually cut by hand, using a very sharp knife held slanting. Great dexterity and considerable strength are needed to make a good job of this hand cutting, and most curators of print departments would bless the inventor of a small and inexpensive machine that would do this more satisfactorily. In mounting the print, it is considered very bad museum practice to cut away any part of the paper on which the print is made. Oftentimes, therefore, a much larger mount is needed than the size of the print really calls for, in order to give an opportunity for storing the extra paper that the artist has thought best to use. The print is placed upon the mount, and marks made where the upper corners come. A thin gummed bank-note paper such as is used for mending torn music or books is generally employed in mounting. This is easily removed, if necessary, and does not render illegible any marks that may be on the back of the print. The strip should be cut the full length of the print, folded in the

middle and gummed to the print, then to the mount. Care should be taken not to use too much moisture on the bank-note paper as the paper of the print is apt to pull when damp and form bad wrinkles when dried. With certain of the Japanese rice papers it is better to make several small hinges instead of one large one, because the paper stretches when wet. When the print has been mounted it should be pressed under a heavy plate glass until thoroughly dry. In the case of prints mounted vertically, the hinge of the cover mount should always be on the left side. With prints mounted horizontally, the hinge should be at the top. The custom of firmly gluing down either the print or the mount has been given up since so much care and study have been bestowed upon the art of the engraver. The back of a print should always be accessible to the student. Where a print comes to a collection already mounted in the old-fashioned manner it may be carefully soaked in cold distilled water by a competent person. Experts in the handling of old prints can restore them in a remarkable way by simple processes of bathing. Brown water spots, for example, can be removed in this manner, and the creases made from improper handling obliterated. Any of the large print collections are in the habit of doing this, and the curator of

a new department who has no previous training in this work will always find himself welcome to such advice, help or encouragement as he needs from the older institutions. Every museum with a print collection should provide a laboratory for the curator, equipped with a very large table (say, 4x8 feet), sheets of heavy plate glass of varying sizes, slightly larger than the standard sizes of his mounts, a flat-bottomed sink (not iron) at least 3x5 feet, with running water, a large-sized pasteboard cutter, and some sort of apparatus for cutting the bevelled edge of his mounts.

EXHIBITING.—In exhibiting prints, small rooms with side-light are the most desirable. Artificial light should be avoided wherever possible, but may sometimes be used as a compromise if the prints could not otherwise be shown. Top-light is very disagreeable and should be avoided, as in making the necessary close observation of the print the visitor gets in his own light.

Some museums prefer to show the prints in individual frames. These are generally uniform in design, adapted to the three standard sizes of mats, and fitted with removable backs. An exhibition is easily changed in this manner and looks very well when hung. If the walls of the print room are of rough plaster, which is undesirable, wires become necessary, and if wires are used

the process of hanging is a long one. If, on the other hand, the walls are of wood, the prints are quickly hung, but also quickly taken down, which increases the danger of theft. Just how serious this danger is, is a matter to be considered by the individual museum director. There are two alternatives: wall cases and desk cases. Wall cases should be made shallow, with doors carefully planned so that the space enclosed by the wooden frame of the glass shall be adapted to the sizes of the mounts. The frame itself should be as small as possible. (In the Fogg Art Museum, Cambridge, an excellent double hinge is used which reduces to a minimum the space occupied by the framework of the glass doors.) These cases must be neither too high nor too low. They may occupy such space on the walls as is required to show three rows of the 14x18 size prints. A storage cabinet for prints of this small size may be provided underneath, if desired, but should not interfere with the visitor's ease in getting close to the prints in the case, for a print is made to be examined closely and does not "carry" as does a painting. Desk cases may also be arranged in connection with storage cases, and are very valuable for showing smaller prints, as it is easy for the visitor to get quite close to them. Thumb tacks or push pins are used for holding

the prints on the back of the case, not by making a hole through the mount but by supporting the mount upon them. This makes an ugly number of spots at the corners but cannot be avoided. The only means of alleviating the difficulty is by placing them at equal distances on all the prints. The same arguments which have been brought forward in favor of showing paintings in one row only, can be adduced in the exhibition of prints. More than one row is disturbing and difficult to see, and in a properly designed gallery is unnecessary.

STORING.—A print collection differs from the other departments of a museum in that the number of specimens in even a small collection renders it impossible to exhibit all at one time. The larger the collection, therefore, the more opportunity there must be for safe storage. In the largest collections, boxes are used in which the prints can be assembled according to artists. There is a difference of opinion as to whether prints should be stored flat or standing up. The object is, in all cases, to prevent the rubbing of one print on another, but some authorities contend that while there is less pressure if the prints are standing up, there is more strain on the hinge and therefore more likelihood of the print becoming creased. The result of these contentions

is that small prints, that is, the 14x18 size, are usually stored standing up, while the larger sizes are stored lying flat. In the expensively appointed cabinets like Berlin, all the prints are stored in boxes built of thin wood and covered with very heavy English buckram. They are arranged somewhat after the manner of the usual transfer boxes, and are bound in leather at the back, where the artist's name and the catalogue number of the box are indicated. They are lined with a pure white paper which is chosen so as to afford the greatest possible protection to the print. As has been said above, the boxes usually contain the work of one artist only, and if the collection is not rich enough to thus fill any box, there are little wooden frames which can be placed in the box to hold the mounts in place. These boxes are stored on shelves like books, the largest ones lying flat on racks provided with rollers, as in a library stack. In Dresden and some other cabinets where the boxes are bound in choice leather, the shelves on which they are stored are covered with corduroy to prevent the rubbing of the wood. Corduroy is purposely chosen because the boxes slip in and out so much more easily in the little grooves formed by the wale of the material.

In collections where so much money is not available for installation, the smaller prints are often

kept in portfolios made of heavy wrapping paper (chosen for its pliability and resistance to wear as well as tested for its purity), and tied up with dark tape. These portfolios are very useful and cheap, and serve to protect the prints in some measure from dust. They should never be used on open shelves, however, but only in dust-proof cabinets. The larger size prints, for convenience in classification, need to be held together in some fashion, and may be simply laid between folds of large wrapping paper. These large prints are conveniently kept on trays which should not be too deep; 1½ inches in the clear is a good height. Cases with trays should be built so that the trays can be pulled out when the doors are open at an angle of 90°. This is important, as it is very often desirable to open two neighboring cases at the same time, and if the case is built so that the doors must be open at an angle of 180°, this is impossible. The same method of fitting the doors to keep out dust which was described above (see p. 149) may be used in these cases. All paper is subject to attack by insects, and the curator of prints may at any time find that he has overlooked a diseased print which is spreading trouble among the others in his collection. For this reason one of the finest collections in the United States has gone to the expense of having its cases lined

with red cedar and the trays built of the same wood. No finish is applied for obvious reasons: 1. Any finish would impair the exhalation of the germicidal odor which is the attribute of cedar. 2. Every finish contains matter which might stain the prints under exceptional weather conditions. In order to run no risk of the prints becoming stained by sap oozing from improperly cured wood, it is best always to lay down a paper on the shelf before putting in the portfolios of prints.

ARCHÆOLOGY

There is no class of material so often poorly exhibited in museums, nor so capable of arousing enthusiasm if properly shown, as that which is the result of excavations. The most serious mistake, and the one most often committed, is in placing before the public quantities of specimens of a similar character. The wholesale exhibition of one class of objects leads to two things: a false impression on the part of the public as to the importance of that particular thing in the daily life of the people of ancient times, and a fatigue of mind and eye which must be avoided if the public is to benefit from the collection. To the great mass of museum visitors the exact position of a handle on a cup or the precise number of geometrical figures used in a design are of no

possible interest. It is of great interest, however, to know that household utensils in the days of ancient Greece were of pottery and bronze, instead of china and tin, and the museum which can reconstruct the life of remote times for us in a vital manner is bound to interest. Such a reconstruction cannot, of course, be made without the help of the student who spends long hours poring over quantities of material of a like nature in its comparison, classification, and arrangement. For his sake, therefore, as well as for our general public, let us have collections of archæological material subdivided to suit the needs of both types of visitors. The student should have side-lighted rooms of a convenient size, with windows low enough to permit him to examine objects under a strong light. The rooms should be provided with long tables, running at right angles to the window wall, upon which the collection in use can be spread. Around the room there should be cases, made as tight as possible, with glass doors wherever practical and with locks. These rooms thus serve as storage space and also as workshops. They should open onto a corridor, but should not be intercommunicating as it is sometimes convenient to give a student the key to one room when you may not wish him to enter the other rooms.

Most objects which come into an archæological collection, especially if they come directly from the field of excavation, are in need of treatment of some kind before they are ready for exhibition. Bronzes from Egypt are almost all subject to the patina containing chlorine salts that is so harmful, and some process of reduction or impregnation needs to be used before it is safe to put them with other objects. Coins are frequently in very bad condition and need to be reduced by an electrolytic process to bring out inscriptions, etc. All objects of terra cotta and limestone are attacked by salt crystals, and need prolonged treatment before the curator can be sure that they will remain secure. The scope of this little book is too limited to enter into details in regard to these processes. Suffice it to say that they have been worked out scientifically and thoroughly by Professor Rathgen, the official chemist of the Berlin Museums, who has published a little handbook for curators called "The Preservation of Antiquities," to which reference has been made before. While there have been continued experiments since that date, and some processes have been modified by further experience (see Museumskunde, vol. IV, pp. 12, 88; VI, 23; VII, 218; IX, 44; XI, 32 and Rhousopoulos, Museumskunde, vol. VII, 95, translated in Museums

Journal, XI, 131), no museum which possesses archæological material should be without a copy, as a clearer understanding by the museum staff of the chemical action of the salts to which all antiquities have been exposed would often prevent disintegration of important specimens.

SAFETY DEVICES

Electricity is a great help in safeguarding museum collections. In every large city in the United States there is a company which makes it a business to assist in watching property at night. This is done by means of telegraphic communication. Wires run from a centrally located office of this company to each building that it is employed to watch, pass through the walls of the building to boxes so located that the night watchman, in order to get to them, must pass through every room. At stated intervals the watchman makes his rounds and puts his key into each box as he comes to it. This registers at the central office, and if a certain number of minutes go by without the reports, the company sends men to investigate the cause of the delay. In the morning, reports are mailed giving the exact time at which the watchman rang in each box. Special safeguards for the watchman may be arranged by having one box that is not rung in regularly. If

he is overpowered by a thief who takes the key and makes the rounds, the central office will be advised of the fact by having a signal from the box that is not generally rung. These same boxes can be used for fire alarms. Where this service is not available, there are other means of controlling the watchman's round. All of these depend upon a box containing a clock and mechanism for registering the time at which a key is inserted in them. Sometimes there are different keys in the various rooms and the watchman carries the clock. In other cases the clock is in the room and the watchman carries the key.

In Europe, police dogs often accompany the watchman and are a great protection to him as well as good company and faithful servants. See Museums Journal, vol. VII, 411, Canine Custodians.

For the safeguarding of works of art either by day or night, a system of electric contact has been installed in many European museums which is efficient and absolutely invisible if desired. It consists in a little spring similar to that in the ordinary push button which rests against the object to be protected. The releasing of pressure immediately rings a bell which calls an attendant. The wires for these attachments are usually hidden, but where visible can be so arranged that the

act of cutting the wires gives the alarm. Locks and bolts are not as efficient as such a device, which may be attached to windows, or doors of cases, or in any place where a thief might be expected to work. The system must be examined frequently and tested occasionally, and should not be allowed to influence in any way the vigilance of the guards and watchmen.

Plate glass can be cut on one side only, and should therefore be set in windows and cases so that the side which can be cut is on the inside.

For fire protection a large hose on each floor and a four-inch water pipe are of some assistance while in certain of the workshops a sprinkler system should be installed. Chemical fire extinguishers in the hands of ignorant or excited persons may prove very dangerous to works of art and should not be provided in a museum unless the guards and janitors are instructed how and when to use them.

CHAPTER VI

Official Questions

HOURS OF OPENING

IT is the custom in this country for art museums to be open on week days from 10–5 and on Sundays from 1–5, while certain of our richer institutions provide for an occasional or regular evening opening continuing from 5–10 P. M., or in special instances from 8–10. The reasons for this choice of hours are that few visitors arrive before 10.30 or 11 and the custodians come at 8, which gives about two hours for the necessary janitor service before they have to go on duty. At 5 o'clock the light begins to fail at most seasons of the year. Sunday morning brings few visitors. A museum of any size finds it impossible to get enough janitors' work done before ten to keep the building clean. It is therefore customary to close for a half-day during the week. Monday morning seems to be the time when the museum is least frequented, and is

a very convenient day to choose because after the Sunday crowds there is much to be done. It is a great convenience for the staff to have a half-day free from visitors, as in changing exhibitions or rearranging cases the short time before the opening of the museum is often not enough to permit of completing any large task. It is to be expected that there will always be people who will be "unable to come at any other time" and that very often, possibly every Monday, a small group of visitors will have to be conducted through the building by a member of the staff.

The question of an evening opening is a mooted one. In every city there will be one or more zealots who will write letters to the newspapers and to the trustees stating that a museum should not be an institution for the idle rich only, but there should be a chance as well for the working man with his family to visit and enjoy the collections. To your answer of Sunday afternoon he will reply: "The working man should have his Sunday out of doors. He does not want to be hived up in a building in the daytime." If you yield to his entreaty and take pity on the working man, you will probably find that your expensive evening opening, when you pay your men double for overtime and have your lighting to arrange

for, has been brought about for a group of fifteen to twenty of your regular constituents! The habit of visiting an art museum in the evening has not been formed, and the moving picture show, where a man can sit at ease in his arm-chair and be amused, is much more attractive than the art museum. A far better method is to arrange for evening openings on special occasions such as, for instance, a visit from the Y. M. C. A. or Y. W. C. A., or for some big group of business men and women such as belong to the commercial clubs or similar organizations. In other words, let the museum make use of the clubs and gain the friendship of the community through its catholic hospitality.

There has been a very serious discussion of the effect of light upon collections and, while the art museum is, in this respect, less subject to harm than the scientific museum, there are yet certain groups of material that do suffer from continual exposure, and these should be protected by dark curtains or some other device, and never subjected to direct sunlight. In these classes are miniatures, water colors, textiles, embroideries, colored prints and Oriental paintings. For the sake of these departments, which are, after all, not the most important in any museum, it does not seem necessary to restrict the opening of the institu-

tion to the public, as is advocated by certain scientific museum directors (see Dr. A. B. Meyer, "Bericht," containing a description of metal curtains at the windows of the Dresden Museum and an important discussion of the effect of light on collections. This is continued by Dr. Bather in Museums Journal, vol. II, p. 320).

Less frequent openings are sometimes necessary in a small museum greatly hampered with lack of funds, but the fewer the days of opening, the more expensive each one becomes because the cost of "accommodation" service is much greater than hiring by the week or month.

ADMISSION FEES

A valuable document has been published on this subject by Henry Lapauze, "Le Droit d'Entrée dans les Musées," S. F. d'Im. et de Librairie, 15 rue de Cluny, Paris, 1902. For many reasons here in America it is deemed wise to charge admission on certain days in the week. The number of free days depends on the generosity of the museum. Two are pretty generally given, Saturday and Sunday, while certain museums add Wednesday, and others even more. There are numerous advantages in having pay days. Our American museums depend largely for their maintenance on the support of their membership,

and in order to induce a man to spend good money to join the museum you must show him that he is going to get something out of it. It is therefore customary to grant certain privileges to members. These include the right to free admission on pay days for himself and his family and house guests, free admission to lectures given by the museum, the receipt of the museum publication, and invitations to receptions given on the occasion of the opening of exhibitions or other events of a similar character. And just here let it be said in passing that to make the museum a social centre for all classes of the population of a city is a necessity if the largest function of the institution is to be fulfilled. Exclusive affairs to attract the moneyed classes, on whom the museum must depend for support, and democratic affairs to which the social settlement groups are invited, must be arranged by the up-to-date director.

Another reason for charging admission is to be found in the desirability of having certain days upon which classes can be held in the galleries or copyists given permission to work without too greatly interfering with the circulation of the public or in turn being disturbed by too many visitors.

The amount of the fee to be charged must always depend upon local conditions. Twenty-five cents is the usual sum chosen in America, on the

principle that a person would think twice before spending fifty cents but that twenty-five is not too much. In this day of ten-cent moving picture shows it is an open question whether an admission charge of ten cents might not bring a larger attendance. In this connection it will be remembered that at the Deutsches Museum in Munich every visitor pays five cents on the principle that any one who wishes, can pay that much, and that the interest of the man on the street is much greater if he has to pay for what he sees. This contention seems to be justified by the number of visitors who go there and who pay their five cents admission. On the other hand, many of the people a museum most wishes to reach have large families and the payment of even five cents each for a group of six or eight is a consideration.

There is no way in which the museum can gain friends so cheaply and so legitimately as through a generous system of issuing free admission tickets. Artists and workers in decorators' shops, all those whose work should require their frequent attendance at the museum and whose funds might limit these visits should be provided with free tickets. Teachers accompanied by their pupils are almost without exception admitted free. The Museum of Fine Arts in Boston is very generous in this respect, admitting free, students of the

various colleges in the neighborhood who come with proper credentials. The friendly feeling thus created is invaluable and more than offsets the few dollars that might be taken in from these same people if they were required to pay. The receipts for admission fees amount at best to a very small sum, and it is therefore unjustifiable to consider them in comparison to the good which may be done by a generous policy in regard to free tickets.

MUSEUM STAFF

The suggestions here offered in regard to staff are worked out with the problem of the medium-sized museum in mind. No scheme can be formulated that can be rigidly adhered to in all cases. Personality counts largely in museum work and the good administrator may find himself called upon to entirely reorganize his staff for the sake of giving to some one peculiarly brilliant individual in his employ the work he or she is best fitted to do. There is no attempt here to consider the problems that arise with a complicated staff of scientific experts. A spirit of co-operation between all the workers is the essential always and matters more than the exact division of duties.

In the following discussion the distinction is

made between the administrative staff headed by the director and composed of all those who are directly responsible to him, whether holding positions of authority or humble clerkships, and the executive staff headed by the superintendent of buildings, which includes all other employees.

Let us consider the character of service rendered in an art museum. A specialized knowledge along many lines which cannot be gained anywhere but in a museum is a necessity. (See The Man as Museum Curator, Museums Journal, vol. I, p. 185; W. E. Hoyle, Education of a Curator, Museums Journal, vol. VI, p 4; Ernst Berger, Die Aufgaben des Conservators in Unseren Museen, Museumskunde, vol. VI, p. 236; W. Bode, Beruf und Ausbildung des Museumsbeamten, Die Woche, 18, 5, 1912.) Continued service means increased efficiency. The director must train every new person coming into his employ. Too often, alas, our boards of trustees are not sufficiently in touch with the work of the museum to understand the character of the demands made upon the staff and to appreciate the fact that they are authorizing the payment of salaries so small that no permanent efficient help can be obtained. Whereas nearly every business man insists upon a high grade of efficiency in his heads of departments and expects to pay salaries in proportion to the training, ex-

perience and brains that he is hiring, the museum trustee, not understanding the exactions of the position, will offer his director a salary that he would not consider giving a man of similar ability in his private employ. This is accepted because the director has some private means or is so devoted to his work that he considers only the big possibilities for service in the new position. Next, not understanding the necessity for accurate work and specialized knowledge on the part of the director's stenographer, the sum of $40 to $60 per month is set aside to pay this salary. The director finds himself required to teach his assistant many things, such as style, set up, accuracy in the use of accents in quoting from foreign languages, and where to get information in regard to museum needs, and often has to put up with inferior shorthand and typewriting ability which is a handicap to him in his work. There is no one little thing that creates more enemies than a delay in replying to letters, and few laymen realize the quantities of mail that come every day to a museum. There are innumerable objects offered for sale which must in most cases be carefully investigated for fear there may be something of value lost to the museum by a too hasty refusal on the part of the director. Then there are many letters from artists who desire to arrange for ex-

hibitions, there is a small number of applications from persons seeking employment, and there is an enormous amount of detail in arranging for any exhibition of the work of a group of artists which requires much correspondence with the painter, the owner of the picture, the insurance agent, etc. If there is a school connected with the museum, the requests for catalogues and advice are without end. But by far the most difficult to answer and the most important part of the museum correspondence comes from the groups of individuals or clubs which are seeking for help in an effort to attain culture through the study of art. To know just how to treat a tender young plant of this kind, to nourish it and strengthen it and train it into useful paths is one of the most important duties of a museum director. The slightest interest in any field of art if properly fostered may bear wonderful results.

The staff of a small museum must necessarily vary with the needs of the collection, but as long as there is an increasing collection, there should be some one besides the director with a technical knowledge of museum subjects. There should be more than one mind represented in the pages of the museum bulletin, and there should be more than one personality to attract *people*. It is very advisable that the director should have an able

assistant who could take his place either in the museum or out of it when he is away. It is frequently necessary for him to take trips to New York or Europe, and there should be some responsible person to take his place. There should be no jealousy between these two people, for their fields are perfectly harmonious and in no way interfere. It is impossible for any one person to make as many friends for the museum as any two people can make. There should always be a second in command to relieve the burdens of the director and leave him free for the important task of spreading the influence of the museum, of arranging for purchases and loans, and for scientific work in connection with museum publications, including catalogues, which require his constant attention.

Another important matter is to provide the director with expert assistance in financial affairs. A trained accountant is of inestimable help. If he is a man of intelligence he may be purchasing agent as well as bursar and attend to securing bids on stenographer's and janitor's supplies and cases, with the proviso, of course, that the final *decision* in regard to expenditure rests with the director and executive committee. In addition to these duties he will receive all bills, check up the items, find out if goods have been received in

good condition, figure out the fund from which they will be paid and make out the necessary vouchers for the signatures of the director and finance committee. Another important part of his work will be the making out of the pay roll and attending to such formalities as may be necessary in the administering of the various funds. All these things are important and if properly attended to will keep one man exceedingly busy in any wide-awake institution. The placing and covering of insurance is another matter that may properly be left to such a man.

Matters pertaining to the membership of the museum and to the issuing of the bulletin, arranging for lectures, accessioning and cataloguing works of art, etc., are other large items in the list of the duties of the director. A museum in the ordinary small town with a population of about 200,000 should have a membership of at least 2,000 persons. In order to attain this, one person should devote her entire time to this alone. There is no reason why this person should not be a woman, and the salary she is paid would easily be made up by the new memberships she should bring in. It should be arranged for her to spend some part of every day in visiting people to tell them of the work of the museum, some part of each day in studying the collections, and

some part in working on the lists, correcting mailing list, entering payments, making out membership cards, etc.

A system of telephones in all parts of the building is an absolute necessity and, of course, requires a switchboard with an attendant. This operator, however, except in the case of a large museum like those of Boston and New York, will have time to attend to other matters as well. It is sometimes thought desirable to combine the duties of cloak-room boy and telephone operator but this is not advisable, for the switchboard *must* be carefully tended and is sure to make demands just at the moment when the largest number of people appear to offer garments to be checked. It is much better to combine the duties of operator with some clerical work of a more or less routine character. Exactly what, is a problem that confronts each museum separately. In Chicago, New York and Boston, well-established museums with a long list of publications, the sale of catalogues and postcards amounts to such a big business that there are special employees to take care of it. In Chicago and New York these attendants also serve as information clerks and ticket sellers. In one museum the offices of ticket seller, information clerk, catalogue and postcard seller and telephone operator were all combined

in one person who at times needed an assistant and at other times, notably on pay days, was greatly in need of occupation and able to take care of the cuts and do other clerical work of a similar character. In a museum of moderate size it should be possible to combine the office of cloak-room boy and information clerk and ticket, catalogue and postcard seller to advantage, with the possibility that on certain occasions it might be necessary to give some assistance while on other days the boy in charge would be perfectly capable of running the addressograph machine, stamping and sealing envelopes, or helping in other ways in addition to his regular duties. In this event, the care of the telephone would be in the hands of a clerk who would be occupied in copying articles or reports or other work which did not require her absence from the telephone desk.

The question arises whether the cloak room should be free or not. It is very difficult to control any dishonesty in this department. We have all been annoyed by being told in museums that the cloak-room charge was "whatever you please." Most museums pay a very low salary, $8–$10 per week for this position, and there is absolutely no chance for advancement. The consequence is, that only a very young or very stupid boy who is willing to undertake something temporary,

or an old man too feeble to hold a better position can be had. It is conceivable that were the boy taken on young enough and given to understand that he might have some hope of advancement in salary and in work there might be a better chance of getting permanent help, sufficiently interested in the welfare of the institution to be honest and reliable. A certain European museum director once said in regard to cloak rooms that to his way of thinking there should be no charge for obligatory checking, but on the other hand there most assuredly should be a charge for voluntary checking. That is, umbrellas, packages and the like which the rules of the museum do not permit to be carried, should be checked free, but for the checking of overcoats, hats, furs, etc., which the visitor may carry in if he wishes, there should be a small and definite charge. Such a system with a placard clearly printed stating these conditions would obviate any difficulties arising from an attempt to get a small fee on the part of the attendant.

We have, then, our Director, Assistant Director, Bursar, Membership Clerk, Stenographer, Cloakroom boy and Catalogue seller. In addition we need some one to attend to the telephone and a librarian. In any museum there are hectic weeks when every member of the staff rushes madly

from early morning till late at night, to do all that needs to be done. Such periods are usually followed by occasions of less strain. The staff, however, must be such that in times of emergency the work can be handled and in dull times there will be enough to keep all busy. The careful administrator will provide for the medium times an adequate force and will study the individuals in his employ so that he knows to whom to turn for extra help when he needs it, and also will keep on hand a large number of routine things that "we will do when we have time" to pass out to his assistants when dull times come. For these reasons it is very desirable that the telephone operator should understand stenography as well as typewriting because in times of stress, when the regular stenographer has all she can attend to, by going to the switchboard and sitting down beside the operator, the director can dictate letters or articles which can be written out in the intervals between calls.

As for the librarian, the need depends, of course, upon the size of the library and the number of visitors. There is little other work that can be accomplished by a librarian because of the necessity for silence. Cataloguing books, slides, photographs, cuts and possibly assisting the director in research work is about all that can

be expected of her. It is therefore incumbent upon the director to advertise the library sufficiently to keep his librarian fully occupied in her own department. It is obvious that she can be of little use elsewhere, because during the hours the museum is open, the library is also open, and cannot be left. The painting of the little accession numbers on the objects acquired by the museum can be done by her, and she can legitimately be expected to care for any print collection the small museum may have. In fact, this latter office of Curator of Prints may very well be combined with that of librarian as the knowledge required in both is similar.

The officers so far under discussion belong to the administrative staff and are therefore under the supervision of the director, with the exception possibly of the cloak-room boy, although his duties of catalogue and ticket seller and any sealing or stamping of envelopes he may do bring him under this class. And here a very important point is to be considered and that is, that in any organization, to be efficient each individual must know to whom he or she is to be responsible. The more unintelligent and the less educated the employee, the more necessary it is that he should know that there is only one person from whom he is to take orders. Confusion in this matter

is often most upsetting, and yet it is well nigh impossible to remember at all times not to give any orders directly, no matter how much easier it would be. Thus, if the cloak-room boy is considered a member of the executive staff any work that he may be required to do for the clerical part of the administrative staff must be given him through the head of the executive staff. As, however, most of his duties fall under the head of administrative staff work it is simpler to consider him in this class.

One other member of the staff stands in a doubtful position, and that is the "gallery man," as he is called in some museums, the man who attends to all the packing, unpacking, hanging of pictures and small repairs to frames, cases, etc. He is, of course, a high-grade and skilled mechanic and for that reason might be expected to stand in the same class as the engineer and under the orders of the head of the executive staff, yet his work is entirely under the director and it is thus much simpler to have him classed under the administrative department. For this position there are many types of applicants. A salary of $100 a month is not too much to pay for the right man as he must have a thorough knowledge of carpentry, a considerable mechanical skill and inventiveness so that he can meet difficult problems

of hanging or exhibiting objects, and he must be skilled in the packing of all classes of *art* objects. A packer with a department store training is of no use whatever. A man who has had some years of experience with one of the big art dealers, who has turned his hand to anything from cradling an old master or cleaning a priceless marble to tinting frames and faking furniture and who has been in the habit of handling valuable works of art for some years, is the most helpful kind of person for this position. Very often the knowledge of the workings of a big shop is useful in a museum and a man who has served successfully under these conditions is adaptable and soon picks up the museum point of view. If the museum has many loan exhibitions each year, this man will be unable to undertake any large jobs besides; if not, he may be able to turn his hand to making cases or other work of a similar nature which will suggest itself to the director. He is certainly worth his salary if he is good at all.

Turning now to the executive staff. The director should not need to bother with details such as who is to mop the floors or do the ordinary dusting around a museum. For this he has a superintendent of buildings whose business it is to understand all about the electric lighting system, the heating and ventilating plants, and the

ordinary cleaning, receiving and shipping of all objects. He should be responsible for janitors and custodians and arrange to hire and discharge them. Where the museum plant is a large one this officer is absolutely indispensable. He relieves the director of certain responsibilities and is personally accountable to him for the safety of all museum objects. In a smaller museum the responsibility may be differently shared. The gallery man may be given charge of receiving and shipping, the engineer take care of heating, lighting and ventilating, and the head custodian take entire charge of galleries. This brings much more detail back into the hands of the director and makes him responsible for the safety of the objects, as is the director of a European museum. On this point it is interesting to note that whereas in America the responsibility for safety from fire and theft is vested in the superintendent of buildings, abroad it is vested in the director himself.

Next to the superintendent the most important man in this section of the staff is the engineer. He must have a thorough knowledge of his boilers and will undoubtedly be able to take charge of the small repairs that are constantly needed in connection with heating, lighting and ventilating apparatus. There are very few museums now equipped with a heating system requiring constant

attention, and unless the plant be a large one the engineer will be the one man in the building who may not always be fully occupied. His hours are long, and his salary not large considering that on his knowledge and ability rests much of the safety of the objects in the museum. For instance, if he does not know how to fire his boilers scientifically the clouds of smoke issuing from the stacks will be unbearable. In some climates and with some plants it is necessary to provide a night engineer as well as a day engineer, although sometimes the night watchman can be trusted to keep the fires from going out during his watch. A certain drop in temperature is, of course, permissible but much variation must not occur or the director will find cracks in his furniture and panel pictures.

It is always a good plan to have at the door of the museum an attendant with a commission as special police officer. One of the guards can obtain this, and it gives him the right to make arrests within the building and to call other police officers with his whistle. Some museums have a regular member of the police force on their staff but if this is done there must be a distinct understanding that so long as he is in the museum building he is under orders from the director or superintendent of buildings and not from without. Un-

less this is done an element of disorder is brought in which is upsetting to discipline.

In museums using turnstiles the man who sells tickets can control the admissions. Where none are used, there must be either a special policeman or the head janitor to watch the people who pass into the building and to prevent the entrance of undesirables. One museum makes it a rule to forbid entrance to persons who are "not suitably dressed." On such points this attendant must rule.

No employee should be allowed to enter the service of the museum without having his references thoroughly looked into. In case the men come through Civil Service, the director should have an understanding with the Commission that no position will be given without a special examination of references. There are few departments of public service where this matter is so important and the Civil Service bureaus are usually overworked and often unable to be thorough in their investigation, though perfectly willing to put all possible information in the hands of the director.

In selecting men as custodians most museums are hampered in one way or another. The European museum, as a part of the state government, is manned by retired soldiers, men who through long service to the state have acquired respect and veneration for public property that makes

them reliable and dependable. These men, once they obtain a position, are there for life unless something unforeseen happens. In America no man takes any such position with the intention of staying in it long,—only until he can find something better. Few museums feel that they can pay more than $50–$60 per month and for this wage permanent, intelligent and active help cannot be had. There are, however, men who have passed the prime of life and are no longer equal to a strenuous day's work, who are glad to take museum positions and who fill them satisfactorily. They must all be strong enough to do heavy cleaning for two hours every morning (from 8–10) and four or five hours on Monday, and they must have sufficient of the hermit's spirit not to leave their beats to flock together and gossip. As to intelligence, that they must possess, although just where it is desirable and where it becomes objectionable is the question. A too garrulous custodian who babbles fairy tales about the objects in his charge is offensive, but a certain amount of knowledge of all the collections of the museum and a little accurate information about the objects directly in his charge is very desirable. A careful and repeated coaching on the part of the director is worth while. Courtesy, even to the most irritating person, is absolutely necessary, and

where a rebuke is to be administered it must be done with tact and discretion. A visitor often unwittingly does something he should not do, and in this event is much taken aback when spoken to abruptly. The museums have lost many friends through rudeness of the custodians. The number of custodians needed depends upon the character of the collections and the number of visitors. For the most part, one man can safely guard three rooms provided they open into each other with doors opposite. In case of crowds, two rooms are perhaps all that should be given to one man, largely on account of danger of vandalism, as the possibility of theft is minimized by a crowd. It would be well to have the custodians instructed and drilled as to what should be done, in case of fire or a panic, in controlling crowds, and what objects are most valuable, should it be necessary to remove them. To have the custodians take turns in assisting the gallery man in changing exhibitions of pictures and other objects is very important, as in that way they become familiar with handling the works of art.

The number of janitors required varies with the size of the museum, but it may be stated as fairly proportioned if there are half as many janitors as guards. In some cases this will prove too large a number. The janitors take care of

polishing floors, which (if they are waxed) needs to be done once a month at least. They also keep the brasses clean and do such other extra cleaning as seems necessary. Their most important duty is to relieve the guards at lunch time. Both janitors and guards should be in uniform, the former not necessarily in an expensive outfit, a plain khaki with the initials of the museum in black is good form. Caps should, by all means, be provided, as they give a trig appearance and serve to identify the museum's men. The guards are provided with cloth uniforms which may be of whatever color the museum chooses. For summer a light-weight serge is chosen. White duck is very effective but the laundry is quite an item.

There is one more employee in this department and that is the night watchman. He is, of course, under the superintendent of buildings unless there is none, in which case he reports to the director. His hours are long and his service is at night, yet his salary is usually small, $60 a month as an average. On him depends the safety of the museum for fully half the time. He must take care of the boilers, make the rounds once an hour, pull the boxes and be fully responsible. He must not go to sleep, and he must have all his wits about him in case of sudden emergency.

To keep the time of the executive staff is quite

a problem. The best administrators deplore the use of any sort of machine control like a time-clock, though with a large staff of janitors and attendants this is necessary. By far the best system, if practical, is that of appointing the men in turn as monitor for a week to keep the time of the others. The superintendent, of course, must see in a general way that the monitor is doing his duty. For the administrative staff the use of a time-clock has been tried and found undesirable. No highly intelligent worker will shirk, —if they do, they are not wanted in a museum. The time when the staff comes to the office and the time that is taken off for lunch is a matter to be controlled by the observation of the director and the conscience of the employee. Any other system breeds discontent and laziness. Unless every member of the staff is so devoted to his or her work that dilatoriness and shirking are impossible, the museum should look elsewhere. There are times of stress when the museum must keep the staff overtime, and the response will be instant from the devoted workers who feel themselves independent, responsible human beings. Time-clock service is greatly to be deplored. It is undependable and unintelligent and must be constantly watched. In these days when the idea of individual responsibility is being used even in

prisons, time-clocks are out of date in museums, universities, and all other institutions where a high order of intelligence is demanded.

CLEANING AND AVOIDANCE OF DUST

The processes of cleaning in a museum, while similar to those in a home, yet contain some elements of difference. For one thing, the first object in a museum must be the avoidance of dust. Some sort of sweeping compound which will collect the dust is therefore very valuable, and a dry mop is the most necessary of tools. Marble floors have to be washed and care must be taken in the selection of the soft soap to be used, as some soaps discolor the marble with excess fats and also leave the surface very slippery. For the marble standing finish, where streaks will show badly, a little ammonia in the water is helpful and no soap of any kind must be used. Cleaning powders also should be avoided. In dusting, the specially prepared oily dusters should not be used as they are hard to wash. A good quality of cheese-cloth is the best duster. It is soft and absorbent and can be washed easily and will not hurt any finish. For the dusting of the furniture on exhibition, this is also valuable. Polychromed sculpture should not be dusted except by an expert such as the gallery man or the director himself,

and then a *very* soft painter's dust brush is the most effective. Tapestries should be dusted from time to time gently and with a soft brush, but this should not be done in the exhibition gallery. Walls hung with textiles should be cleaned once in six months with a vacuum cleaner, which can also be used around the radiators. The objects on exhibition should not be cleaned with this apparatus. The presence of dust in a museum is not only unsightly, it is dangerous, for it breeds moths, mice and other pests besides being injurious to the objects on exhibition. Paintings should not be touched by the janitors or custodians but should be dusted once a month or once in two months at most, by the gallery man, using a piece of soft, clean China silk to wipe off the face of the painting and a soft brush or clean dust cloth on the frame. Marble and bronze sculpture also can be dusted with a clean painter's brush. The ordinary cleaning of casts is best done in this way also. A feather duster is an instrument of evil. It scatters the dust and the little bones in each feather are always sharp enough to scratch any object they may touch.

Care should be taken in the use of all cleaning tools. They must be soft and clean or they will do more harm than good.

RULES FOR COPYISTS AND PHOTOGRAPHERS

The policy of a museum in regard to its relations with copyists and photographers is a difficult one to form. There is no doubt that the advertising value of copies and photographic reproductions is very great. It remains for the museum to decide whether it is better to restrict the public privileges or to give all possible encouragement. The first point to be considered is whether any of the objects have been copyrighted, and here let it be stated that there are two kinds of copyright, the artist's and the owner's. A little pamphlet containing the law on this subject is issued by the government. (For English law, see Copyright of Works of Art in the Museums of Britain, E. E. Lowe, Museums Journal, vol. III, p. 147.) Suffice it to say that a museum owning a picture has no right to copyright the picture itself. It can only copyright *reproductions* of that picture. Therefore, in buying a picture, the museum that desires really to *control* the reproductions of that picture must also *buy* the artist's copyright. The question is, how much advantage accrues to the museum from owning this right. The Picture Gallery in Basle, Switzerland, is one of the few museums in any country that has made a satisfactory and profit-

able use of copyrights. It owns quite a large number of Böcklin's paintings and buys a good deal of modern art. In each case it buys the copyright as well. This in turn it rents to publishers who are glad enough to pay a moderate price for the right to make photographic and postcard reproductions and printed sets of the works of different artists. These are put on sale on the open market and at the museum, which clears a tidy little profit each year from royalties and sales. Incidentally the museum can control the quality of reproductions. The proceeds from this form a fund for the acquisition of prints, in this particular case.

A picture copyrighted by the artist cannot be either copied or photographed without a special permit. In order to secure this copyright it is necessary to place upon the front of the canvas the sign "© (copyright), (date)....., by..... (name)." Where only a certain reproduction is copyrighted the plate and each print bear the same mark. It is thus very easy to tell which works have been copyrighted.

Some owners are very particular not to have their pictures photographed, and in securing a loan exhibition it is always wise to secure the owner's permission to have it photographed so that there would be no trouble should occasion arise.

In general the rules for copyists are the same in all museums. The authorities must first be satisfied as to the character and artistic ability of the applicant. Second, copyists can only be admitted on pay days. (This often gives rise to much complaint on the part of the people who have paid to get in! On the other hand it is difficult, if not impossible, for a copyist to work on a crowded day, and they are much more in the way when there are many people all trying to see at once.) Third, the copy should not be the exact size of the original. Fourth, the copyist must provide a good-sized cloth to lay on the floor under the easel. Fifth, the copyist must not engage in conversation with the public, nor offer his work for sale. The museum is a place for serious study, not a shop. Sixth, every copy made in the museum must be taken to the office when completed. There it will be examined by the director and clearly marked "COPY" on the back of the canvas before it may be taken from the building.

In some American museums the third rule is now done away with, as the marking of "copy" on the back of the finished picture is considered a sufficient safeguard. For an interesting discussion of this subject see in Schinkel's letters, vol. II, p. 321, Wilhelm Freiherr von Humboldt, Aug. 21, 1830, on Copying in Galleries.

Permits are usually issued which must be shown to the guards on demand. For pencil notes or sketches no permits are required. One great collector in New York strenuously objects to having even notes of color combinations made from a case containing his miniatures, so that there should always be an understanding in the matter.

In regard to photographs, it is getting to be more and more the custom to permit the use in the museum of small cameras and kodaks rather freely, provided the owner signs a promise not to put any of the prints on sale.

MUSEUM PUBLICATIONS

Under this head must be considered the bulletin, catalogues, postcards, notices of exhibitions and photographs. There is no one thing more important than the bulletin. On it rests the major part of the reputation of the museum outside the small group of intimates who know its development from day to day. The greatest care should be taken in the choice of paper, the quality of the reproductions and the kind of printing. The physical make-up of the little magazine is important because unless it is attractive and well done, no matter how illuminating the reading matter may be, it will not be read. In the presentation of material several things must be

borne in mind. The object of the bulletin is *primarily* to interest and instruct a lay public; therefore articles of a purely academic nature are undesirable. On the other hand, infinite care must be taken never to talk down to the public. State things in an interesting way, avoid excess of technicalities, and make the reader feel an overwhelming desire to go to see the object described. The bulletin is *not* the place to print articles of a scientific nature which will show the depth of the knowledge of the members of the staff. Accuracy of statement is essential and the aim of the bulletin should be to bring to the attention of its public the breadth and scope of the collections as well as to point out the most interesting objects. An occasional article on collecting or on contemporary art or a discussion of exhibitions in other cities can be introduced with good effect. But in the case of the latter it is questionable policy to report an exhibition in a neighboring city when it is too late for the readers to profit by the description in going to see the show. All matter of a controversial character should be excluded from the bulletin of the museum.

Some bulletins carry advertisements which greatly help in the expense of publication. However, when this is done there should by all means

be a business manager to handle this end, for the museum director should be too fully occupied with his other duties to be able to spare the time for getting advertisers and making up a complicated "dummy."

Catalogues are the proper medium for the expression of scientific knowledge. They should not in any way take the place of labels, but they should by all means supplement these. A catalogue, to be of great value, should be a reference book which can be used for special study in the gallery, but which is most valuable for use at home. Illustrations are infinitely more vital than description, and the latter should be used sparingly to supplement the former. But, in order that the illustrations may be more useful, they must be inserted in the text and not placed together at the front or back. An admirable illustration of good catalogues is to be found in the publications of the Kaiser Friedrich Museum in Berlin. The chief fault one has to find with these is the large size in which they are printed which makes them awkward to use on the spot in the gallery itself. The catalogues of the Metropolitan Museum are satisfactory in size but often printed on such heavy paper as to be quite cumbersome to use.

There are a number of firms in the United

States who make a specialty of the publication of postcards. Hardly any of them, however, are able to vie with the results obtained by the German postcard makers in clarity of detail or soft, velvety finish, while the prices they charge are so high as to be almost prohibitive. The Art Institute in Chicago is a shining example of how to cater to public demand and make money at the same time. They publish most of their own cards, having cuts made by an expert and printed by the best printers with care on specially selected stock. Their largest sales and largest profits are on the black and white reproductions sold at one cent each. Color cards should never be sold by a museum unless they are very accurate both in tone and in exact registering of plates. The museum should stand for the *best* in all such work.

It is very difficult to find any commercial photographer who understands how to photograph paintings or works of art. For this reason it is highly desirable that the museum should, whenever possible, have some one on its staff who can attend to this matter. The modern systems of registration call for small photographs of every object to be pasted upon the accession cards and these should, of course, be made within the museum. The expense of this is considerable unless it can be done in odd minutes by some one

already employed in another capacity, or unless the museum has so much of this work that it requires a photographer constantly in attendance. It is often convenient, too, to have some one take pictures of transient exhibitions for use in the newspapers. The same person can make the photographic postcards, and should have a camera of 8x10 size to use in making prints for sale if the museum is fortunate in owning anything that reproduces well and has a popular appeal. The small prints for accession cards can be made with the same camera by using a system of shutters to cover parts of the plate such as is in use in the shops where penny pictures are taken.

RECORDS

The needs of each museum in respect to blanks are wholly individual and must be met by the ingenuity of the director or by the aid of an expert efficiency man, although the latter never thoroughly understands the peculiar problems of the museum. The system developed by the Metropolitan is fitted to an enormous institution but is too cumbersome to be useful, without modification, in a smaller museum. The Boston system has a number of good points but again is not wholly satisfactory. Both of these institutions send out information carefully tabulated and

copies of their forms, to any one interested. This subject has not received the attention that it deserves and the following detailed description is therefore perhaps not untimely.

In practice in a medium-sized museum the problem and its solution are as follows: There are two places at which objects coming into the museum are received: 1. the shipping room at which all loan exhibitions coming in by express or freight, special loans from individuals, if delivered by a team or expressman, and objects sent on approval by dealers, are received; 2. the director's office where are received objects brought in by hand, for examination, as loans, as gifts, offered for purchase or to await action of accessions committee. There must, of course, be some means of checking all of these objects both coming in and going out. An exact record must be kept, as otherwise there is always a possibility of trouble.

For objects received in the shipping room a special form of record can be used upon which is entered the date, number of boxes received, from whom (i. e. what express or transfer company), name of shipper, valuation and charges. Each box, as it comes in, receives a number which is also entered on this blank. A similar sheet is kept for outgoing shipments. Here we have the date, number of boxes shipped, numbers on the boxes,

to whom, by what express, valuation and charges (prepaid or collect). By means of these two lists a complete record can be easily kept and the bursar has a ready means of checking up the express bills.

There is, however, one more form which must be kept in the shipping room, and this is the box list. It has already been stated that every box is numbered as it comes in. This number is entered upon a blank and, following it, the name or description of every object in the box is entered. This is sometimes a long process, but it is very necessary. Let us suppose a case. A dealer sends fifteen American paintings to a special exhibition. They arrive on January 26th in five cases which are numbered 90–94 inclusive. They go on exhibition for a month and are taken down February 28th. As no word has come from the dealer telling what is to become of them after this date, they are put in storage. About March 15th comes a letter from the dealer asking to have Nos. 1, 5 and 7 sent to Detroit, No. 11 to Boston and No. 8 to Chicago; the remainder are to be returned to New York. In the office where this letter is received the records are consulted and the following notice to the packer made out:

ORDER No. 16

Please ship to-day via *Franconia Express*

X Prepaid, Collect, Valuation *$500 on each box*

To Messrs. Roderique & Son

310 Fifth Ave., N. Y., N. Y.

Nos. 2, 3, 4, 6, 9, 10, 12, 13, 14, 15, in February exhibition, being paintings by Davis (1), Hassam (2), Friesecke (2), Davies (1), Bellows (1), Henri (2).

William Leavitt, Director.

March 16, 191– These *paintings* were rec'd *Jan. 26.*

A similar notice is made out for the special shipments requested by the dealer. The packer then consults his list of arrivals, and finds under date of January 26th: "Received 5 boxes numbered 90, 91, 92, 93, 94, from Roderique & Son, via Franconia Express, $500 on each box, charges prepaid." Turning to his box list he finds that box 90 contained pictures 15, 3, 5, 7, etc. But owing to the fact that all the pictures are not to be returned to the same place, they must be differently packed, so he enters in his list the fact "Box 90 shipped to Detroit per order No. — with Nos. 1, 5, 7." A similar record is kept of all the pictures which are packed in the old boxes as far as possible. In his shipping list he enters

"Shipped March 16, 3 boxes Nos. 91, 92, 94 to Messrs. Roderique & Son, N. Y., via Fr. Ex., $500 on each box, charges prepaid." On the same day he notifies the office that the shipment has been made, and the office writes a letter to Detroit, to Boston, and to Chicago, saying "We have been asked by Messrs. Roderique and Company to send you certain pictures (mention them by name). They have been shipped to you to-day via Franconia Express prepaid, valuation $500 on each box. Kindly notify us if you do not receive them promptly." To Messrs. Roderique and Company a letter goes, repeating their instructions and stating that the shipment has been made.

There is thus a complete record on file of all the processes in the handling of this shipment. The notification to the lender that a shipment has been made is important legally in case of loss in transit.

We have already referred to the office end. Let us return to that and see what records are kept there. When the record has been entered in the packer's lists, he notifies the office that he has received a shipment and what it contains. The director then decides what is to be done with the objects, brought to his office, put in the store room, or on exhibition. He then notifies his assistant who enters in the loan book the fact of

its arrival with date. The headings of the spaces in this book may be arranged as follows:

Date rec'd.	Loan No.	Title of work.	Name of artist.	Lent by	Insured amt. and by whom.	Valuation.	Date ret'd.

The numbers in this book are consecutive during any one year. And right here let it be stated that there is no one thing which causes more inconvenience and difficulty in bookkeeping than having the beginning of the fiscal year come at some other time than at the beginning of the calendar year. For in all the systems of numbering in use in museums, the year of acquisition is always used in conjunction with the running accessions number, and to figure exactly how many objects had been received from October 1st to October 1st is always inconvenient and confusing, whereas from January 1st to January 1st the last number itself tells.

Any object which is loaned to the museum for exhibition purposes is entered in this book. An object sent in for examination *only* should be

entered in a book kept by the director himself as follows:

Date rec'd.	No.	Class of object.	Title.	Attrib-uted to	Sent in by	Val.	Re-marks.	Date ret'd.

In this way, a confidential record can be kept which may save much trouble especially when the same object is presented again by another party, as frequently happens. In this book the numbers should be simply consecutive.

Any object offered as a gift or for sale is entered on a special blank such as those shown on pages 243 and 245. To these blanks are attached any correspondence there may be about the object, and notes made by the director. When action has been taken the blanks for objects accepted are passed on to the assistant in charge of the accession book who enters the information necessary, *provided* the object has been received by the museum. When this is accomplished the blank goes to the bursar who finds in it his authorization to pay the bill when presented. These blanks he then keeps arranged according to date.

The card catalogue of accessions and the accessions book together form the index for these blanks. Gift blanks and blanks for objects offered and not purchased are kept on file.

We come now to identification of the objects themselves. It is customary to use a little paper sticker or a small strung tag for objects loaned to a museum. These stickers have the name of the institution printed upon them and the loan number is written in in ink. Objects temporarily in the museum, as those which are offered for purchase or sent for examination, do not receive any number to identify them. The regular accessions, however, have the number painted on with bright red or black oil color paint, sometimes mixed with siccatif or varnish. Care must be taken that these numbers are so placed as to be as inconspicuous as possible. On paintings, they can be placed upon the back of the canvas or stretcher, on small bronzes, on or under the base, on porcelains, under the base, etc. Laces are marked with tags of linen tape upon which the number is written in indelible ink.

A form of loan or temporary receipt is very necessary in some instances. The Metropolitan uses both. In a smaller museum one is quite sufficient. Forms are given here for both, but most museums will find it sufficient to have only some-

thing similar to the temporary receipt form printed. These should be numbered consecutively and are convenient if made in book form although in tablet form they can be used in the typewriter.

One other form is necessary, and that is the sticker to be attached to objects taken out of the building. Persons entering the building are obliged to leave parcels, etc., at the door unless they ask for the director and have something to show him. In this case they are allowed to take the package in but they may not take it out unless it is provided with a pass made in two pieces, a stub which is glued to the package, and an end which is torn off by the gate keeper and returned to the office. Objects going out by the receiving-room door must all be checked by the packer or superintendent of buildings, and do not need this tag. Since the theft of the Mona Lisa, a visitor to the Louvre is not allowed to take from the building a photograph or a package of postcards which he has bought in the gallery, without being provided with a pass one end of which is pasted over the joining of the wrapping paper so as to insure the impossibility of opening it and substituting some other object. These stickers are best made of paper that is not too thick and should be well gummed.

Form letters are used by some large museums

but in most cases a simple note can be dictated quite as quickly as to indicate the form to be used, and the impression created is much more favorable. A somewhat elaborate form in the nature of a diploma is used in acknowledging a gift, and this is of value psychologically, especially in dealing with certain types of persons. A suggestion for this form is shown on page 246.

Every object acquired by the museum, whether by gift or purchase, should be entered in the accessions book in the order in which it is received, but—no object should be counted as an accession until it has been received, unpacked, numbered and entered. Suppose, for instance, a museum were to acquire a collection of fifty snuff boxes, and pay for them on September 30th, and on October 2d at the annual meeting announce the purchase and add fifty to the number of accessions for the year. By some misunderstanding or delay, the shipment is not made until January and the boxes come at a very inopportune time and cannot be unpacked till February. By rights, having announced the purchase, fifty numbers should be left in the accessions book and the other objects received after the report put in later, but this case is often exaggerated and sometimes the exact number of pieces in a new collection is not known. It is therefore much better to count no accession

that is not entered in the book. This book should be kept in library hand and should be the responsibility of one person and one alone. It should be arranged so that the material to be entered goes across two pages, and it is very convenient to have twenty-five lines to the page. The usual number of objects allowed for in a book is five thousand. The page should be divided as shown on p. 252 of Appendix. A loose-leaf accessions book should not be used because of the danger of loss of any sheet. Each line is provided with a running number so that the museum can at any time discover the number of its accessions, but this is not the accessions number. This last is a compound made up of two figures to indicate the year of the accession and the running number to indicate the order in which the objects have been acquired in the year. Thus in 1916 the thirty-second accession in that year would be numbered 16.32. In some museums these numbers are reversed, thus, 32.16. The loans receive similar numbers preceded by the capital letter L. Again, some museums use the two combinations differently, i. e. for accessions 16.32 and for loans L. 32.16. This system, however, is apt to be confusing until one is thoroughly familiar with it, and there is little danger of mistake because the loan number is *never* put

directly *on* any object but always on a tag or label attached to it.

There is never but one copy of the accessions book. The card catalogue of accessions, however, should be made in duplicate or triplicate according to the size of the museum. It should be kept thoroughly up to date and there should always be a complete copy somewhere outside the museum building in case of accident of any kind, fire, earthquake or other disturbance. One copy should always be in the director's office, another, covering all material in his department, in the office of the curator. A sample card will be found on page 251.

All information should be on the front side of the card. Certain museums use cards of extraordinary size. This is quite unnecessary. The most satisfactory method is *always* to use standard sizes. The ordinary 4x6 card is quite large enough. It should be without lines, so that it can more easily be used in the typewriter. For this reason also it should be of rather thin board. The custom of mounting a small photograph of the object upon the card is admirable. It makes identification much simpler, and where this is done it also makes a long and detailed description of the object unnecessary. The best museum practice demands that only such facts as cannot be

discovered in the photograph be entered on the card. Some museums enter the name of the dealer from whom an object is bought and the price paid, on the accession cards. This material has its proper place in the accessions book but should not be accessible to the public. The card catalogue, like the catalogues of a library, should be such that a competent student might consult it at his leisure.

ADVERTISING

The time has gone by when the trustees of a museum are satisfied to have their institution merely a storehouse of dead art. It must be a living and vital force in the life of the community, and in order that this shall be so, something must be done to bring the people to the building.

Educational work with the school children is, of course, the best method of advertising that could be devised, for where the children know and understand the collections, the use of the museum by the "grown ups" is bound to follow. So strongly has this been felt that museum instruction has now become a distinct branch of museum work.

But there are many other forms of advertising that have received the sanction of usage in our best-known museums to-day. The commonest of

these is the use of display cards in or upon the street-cars of the city. In some cities these are only used in the cars running directly to the art museum. In other cities they advertise the collections or temporary exhibitions, and are to be found in all the cars. In certain rare instances where the president of the street-car company happens to take a special interest, these cards are carried free. In other places the museum is obliged to pay for them as any other enterprise would have to do. But the art of advertising does not stop with the decision to spend some money on display cards. The form in which they are printed is important, and the museum must realize that all advertising is governed by psychological laws, and that a design for street-car cards that would be very appropriate and delightful if it could be examined at close range is often totally illegible or unattractive when seen from the sidewalk or even from the length of the car. Brilliant color can be artistic and it has carrying power. The legend must be short and to the point.

Some museums have discovered that they can reach the newcomer in their city by means of small advertisements placed in the railroad stations and hotels, and although both hotels and railroad stations are loath to break their rules

against the display of such cards, they can sometimes be induced to place a small and well-designed sign of this sort where it will do a great deal of good. In a city where there are several museums, co-operation between them often secures opportunities of this kind which would not otherwise be available. Almost every city now has an active organization interested especially in the development of its resources; sometimes a chamber of commerce, sometimes a private association or club like the Minneapolis Civic and Commerce Association. Through this agency, cards can be distributed, giving the hours that the museum is open, price of admission, and a summary of the collection, as well as indicating the main lines of approach. Free publicity is given by the prominent newspapers, either in their news or art columns, to announcements of lectures, special exhibitions, new accessions, or items of general news. Some museums regard this as of such importance that they have a special publicity manager on their staff. Others attempt to handle the giving out of news through the separate departments.

Almost all of our larger museums spend a certain amount of money in advertising of one kind or another. The most scholarly form which this takes is, of course, the museum bulletin, but this

organ is read by a very small number of the people to whom it is sent. We are trying more and more to make the collections in our museums tell their story and interest the public, and very soon we shall find that the bulletins also will be written with this special object in view and they will no longer be thrown away. In this respect, the museum is in the same position as the commercial house publishing its "house organ," and some of the methods adopted in the clever little magazines produced by some of these firms might well serve to assist the museum to perform its mission of educating through its bulletin. Many of the museums and art societies are sending out postcard notices to their members, giving a list of exhibitions and lectures, and these may be made very valuable; but a cleverly worded and well-designed paid advertisement in the newspapers would be still more efficacious.

Certain of our museums are undertaking advertising of a different form by conducting campaigns for civic betterment with headquarters at the museum. This is a perfectly legitimate method and brings a museum into close relation with the people of the city. Many museum officials who are imbued with traditions of scholarly aloofness look askance at such movements as city-beautiful campaigns and bird campaigns. These

may not be directly connected with an art museum, but they are directly connected with the interests of the city, and what is more logical than that the museum should be the centre from which radiates civic improvement? We are living in a different age from that of our fathers, and it is only right that the museum should make use of the different agencies open to us in this generation.

In this connection, a rough table showing the percentage of art museum visitors to the population in seven cities may be of interest. The population is figured in all cases from the census of 1910, the attendance figures are in some cases for 1915, and in some cases for 1914, according to the data available.

Toledo, 68%	St. Louis, 24%
Chicago, 40%	Minneapolis, 19%
Boston, 32%	Indianapolis, 15%
	New York, 14%

It is interesting to note in this connection that Toledo does more advertising than any other of these museums, and the result is obvious. There is hardly a street urchin in the city who does not know and love the museum. Whatever the prejudices in favor of the dignity of a museum, all directors are trying to bring cultural influences into the lives of the people, and in order to do

this there must be some way of increasing the attendance. Advertising is the modern medium, and to be up to date the museum must extend its advertising.

CONCLUSION

After studying all phases of the situation and reading such articles as are available on the subject, in order not to duplicate costly and unsuccessful experiments, the museum director must proceed according to his judgment. There must never be a universal standard of right and wrong in our museums. Each one must be individual and distinguished in some special way. The collections are the important feature and the genius of the director will show in his ability to make them vital and original.

APPENDIX

BLANKS

IN printing blanks for use in a typewriter, the printer should be warned to arrange the lines according to the width of the spacing on the machine to be used.

NAME OF INSTITUTION

OFFER FOR PURCHASE

Object.....
Price.....
Offer received { by letter.....Date.....
in person.....
Name.....
Address.....
Remarks.....
I recommend that this offer be.....
..... Director.
Action of Acquisitions Committee.....
.....Date.....
(Signature).....Chairman
Action of Executive Committee.....
.....Date.....
(Signature).....Chairman
Notice of action sent.....

NAME OF INSTITUTION

LOAN

Object.....

Offer received { by letter.....Date.....
in person.....

Lender.....

Address.....

Remarks.....

I recommend that this offer be.....

.....Director

Action of Executive Committee.....

.....Date.....

(Signature).....Chairman

Notice of action sent.....

NAME OF INSTITUTION

GIFT

Object.....

Offer received { by letter.....Date.....
in person.....

Donor.....

Address.....

Remarks.....

I recommend that this offer be.....

.....Director

Action of Acquisitions Committee.....

.....Date.....

(Signature).....Chairman

Action of Executive Committee.....

.....Date.....

(Signature).....Chairman

Notice of action sent.....

ACKNOWLEDGMENT OF GIFT

THE BLANK
MUSEUM OF ART
BLANK

THE TRUSTEES OF
THE BLANK MUSEUM
OF ART GRATEFULLY
ACCEPT THE

.....
.....
.....

WHICH.....
HAS KINDLY GIVEN TO
THE MUSEUM.

.....
SECRETARY.
.....

The two following blanks should be made out in duplicate and the carbon kept on file:

Loan Receipt No...

NAME OF INSTITUTION

.....19..

Received from.....

as a loan for....., the objects described below, subject to the conditions printed on the back of this sheet.

.....Director.

No.	Description of Objects.	Value.

CONDITIONS TO BE PRINTED ON BACK OF RECEIPT

1. Objects will not be returned to their owners except on presentation and surrender of this receipt, or, if it be lost, upon certification of such fact by the owner, or his legal representative, and presentation of a written order for delivery signed by the owner or by such representative.

2. In case of the death of a lender, the legal representative of the deceased shall notify the Director of the Institute forthwith, giving his full name and address in writing.

3. The Institute of Arts assumes no responsibility in regard to objects loaned to it for exhibition beyond the exercise of such precautions as are observed for the safeguarding of its own collections.

4. Permission to copy or photograph works of art lent to the Institute is granted only after consent has been obtained from the owners.

Temporary Receipt No.....

NAME OF INSTITUTION

.....19..

Received from { Name..... Address.....

Offered { for gift..... as loan..... for purchase.....

the objects described below, subject to the conditions printed on the back of this receipt.

For the Director.....

No.	Description of Objects.	Value.

CONDITIONS TO BE PRINTED ON BACK OF RECEIPT

1. This receipt must in all cases be returned to the Institute upon notification of the action of the Trustees in regard to the objects hereon enumerated.

In the case of accepted loans another receipt will be given, and in the case of purchases or gifts accepted this receipt becomes void.

2. Objects will not be returned to their owners except on presentation and surrender of this receipt, or, if it be lost, upon certification of such fact by the owner, or his legal representative, and presentation of a written order for delivery signed by the owner or by such representative.

3. The Institute will take the same precautions with objects temporarily in its possession as with its own permanent collection, but will not assume any further responsibility for such objects.

If the receipt is not presented when objects are returned a receipt should be given the museum by the person taking the object away.

ACCESSION CATALOGUE CARD

Accessions number	Class	Country	Century
	1. Artist's name.....dates of birth and death.....		
	2.		
	3. Subject or name of object and description.....		
	4. Date if known.....		
	5. Marks.....Material.....Size.....		
Photograph	6.		
	7. Purchase, Gift, Bequest.....		
	8.		
	9. Provenance.....		
	10.		
	11.		
	12. Published.....		
	13.		
	14.		
	15.		
	16. Photographed by.....		

The numbers indicate the line in the typewriter. The spacing is arranged for a card 4×6 inches.

PASS

NAME OF INSTITUTION	NAME OF INSTITUTION
	Gatekeeper's Check
Pass the.....	Pass the.....
to which this is attached	to which this is attached
Signed.....	Signed.....
Date.....	Date.....
No.....	No.....

ACCESSIONS BOOK PAGE, LEFT-HAND LEAF

Running No.	Accession No.	Date.	Description.
1	16.1	Jan. 15, 1916	Painting, Portrait of George Washington by Stuart
2	16.2	Jan. 26, 1916	Iron bracket, Italian, Florentine, XVI Cent.
3			

ACCESSIONS BOOK PAGE, RIGHT-HAND LEAF

Gift or Purchase.	From Whom Acquired.	Remarks.	Measurements.	Cost.
Gift of Mrs. J. Brown				
Purchase	Roderique & Co. 310 5th Ave., N. Y.	Formerly on the Palazzo Vanni, Florence.	Stretcher 24 X36 12 X36	$350.

BY-LAWS

The following are the Articles of Incorporation and By-Laws of the Minneapolis Society of Fine Arts, which are here published by courtesy of the President of the Society. They take the place of the charter or constitution which in some states is necessary. They are included here as an example of the subjects to be covered in such cases, but could not be used without modification. It is the custom, and a very wise one, to have the director present at all meetings of the trustees, and at any meeting of a standing committee at which matters with which he is familiar are to be discussed. He should be thoroughly in sympathy with the trustees, and they with him, or the work cannot prosper.

ARTICLES OF INCORPORATION
OF
THE MINNEAPOLIS SOCIETY OF FINE ARTS

(Filed February 2, 1883).

We, the undersigned, do hereby associate ourselves for the purpose of forming a corporation under the provisions of title three (3) of chapter thirty-four (34) of the general statutes of the State of Minnesota, and the acts amendatory thereof, and to that end hereby adopt and sign the following Articles of Incorporation:

ARTICLE I

The name of the corporation shall be "The Minneapolis Society of Fine Arts."

The general purposes of this corporation shall be to foster and to promote educational, artistic and scientific interests. No pecuniary gain or profit shall accrue from membership in the Society.

The plan of operation of the Society shall be to establish, own or control, and to maintain, museums, galleries and libraries; to acquire books and manuscripts, scientific collections, and objects of fine and industrial arts; to institute and support schools, and to provide lectures, instruction and

entertainments in furtherance of the general purposes of the Society.

The location of the corporation shall be in the city of Minneapolis, Hennepin County, Minnesota.

ARTICLE II

This corporation is formed without capital stock.

ARTICLE III

Section 1. Those persons who are now, or shall hereafter become, benefactors, patrons, fellows in perpetuity and fellows for life, and such other classes of members as may be established by by-law and so designated, shall be members of the corporation entitled to vote for the election of trustees of the Society, and upon other matters pertaining to its direction and the carrying out of its purposes. Such persons shall be known as Governing Members. At any meeting of the corporation, any of such members shall have the right to be represented by proxy, to be appointed in writing signed by such member.

Section 2. Any person who shall contribute to the Society money or property, accepted by the Society, of the value of twenty-five thousand dollars ($25,000) shall be eligible to be chosen a

Benefactor of the Society by the Board of Trustees, and, when so chosen, shall have the privilege of appointing a successor, who shall be a fellow in perpetuity, with all the rights of such fellow.

Section 3. Any person who shall contribute to the Society money or property, accepted by the Society, of the value of ten thousand dollars ($10,000) shall be eligible to be chosen a Patron of the Society by the Board of Trustees, and, when so chosen, shall have the privilege of appointing a successor, who shall be a fellow in perpetuity, with all the rights of such fellow.

Section 4. Any person who shall contribute to the Society money or property, accepted by the Society, of the value of five thousand dollars ($5000) shall be eligible to be chosen as a Fellow in Perpetuity of the Society by the Board of Trustees. Such person, when so chosen, shall have a fellow's right in perpetuity, with the privilege of appointing a successor in such fellowship in perpetuity, in the manner prescribed by by-law.

Section 5. Any person who shall contribute to the Society money or property, accepted by the Society, of the value of one thousand dollars ($1000) shall be eligible to be chosen a Fellow for Life by the Board of Trustees.

Section 6. The Governing Members of the corporation may, by by-law, constitute other classes

of members, upon such conditions as the by-laws shall prescribe, who shall be entitled to free admission to the exhibition rooms of the Society at all reasonable times, and the enjoyment of such other privileges as may be permitted by by-law.

ARTICLE IV

Section 1. The government of the corporation and the management of its affairs shall be vested in a Board of Trustees, consisting of not less than fifteen nor more than thirty elective members, to be fixed by resolution of the Board of Trustees, and, in addition, the Mayor, for the time being, of the City of Minneapolis, the president, for the time being, of the Board of Park Commissioners of the City of Minneapolis, the president, for the time being, of the Library Board of the City of Minneapolis, and the president, for the time being, of the Board of Education of the City of Minneapolis, *ex officio*. Said elective trustees shall be chosen by the Governing Members of the corporation at the annual meeting of the members which shall be held at the office of the Society in the City of Minneapolis on the second Wednesday in October. Said Trustees shall hold office, respectively, for the term of five years and until their successors shall be elected and shall enter

upon the discharge of their duties, and shall be divided into five classes, as nearly equal in number as may be, and the terms of office of said classes shall expire in successive years, so that in each year the members of one class only shall be elected for the full term of five years. Whenever the number of the Board of Trustees shall be increased, the additional members shall be elected by the Board and each of the newly elected Trustees shall be assigned by the Board to one of said classes, and his term shall expire with that of the class to which he is assigned. In case a vacancy shall occur in the Board of Trustees, by reason of the enlargement of its membership or otherwise, the existing Trustees may fill the same for the unexpired term, at any regular or special meeting of the Board.

Section 2. The officers of the corporation shall be a president, three (3) vice-presidents, a secretary and treasurer, all of whom shall be elected by the Trustees and shall hold their respective offices for one year, and until their successors shall be elected, and shall enter upon the discharge of their duties. The offices of secretary and treasurer may be held by the same person.

Section 3. Five trustees shall constitute a quorum of the Board of Trustees, and, at all meetings of the corporation, thirteen members

shall constitute a quorum for the transaction of business.

ARTICLE V

The directors of this corporation may, from time to time, make such rules, regulations and by-laws, not inconsistent herewith, nor contrary to law, as may be deemed necessary or expedient for the management of its affairs, and to carry out effectually the purpose of this organization.

In witness whereof, we have hereunto set our hands and seals this 31st day of January, A.D. 1883.

Here follow names of twenty-five incorporators and acknowledgment of their signatures.

BY-LAWS

OF THE

MINNEAPOLIS SOCIETY OF FINE ARTS

ARTICLE I

OFFICERS

Section 1. The President and Vice-President shall be elected by the Board of Trustees from among their own number. The Secretary and Treasurer shall be elected by the Board of Trustees, but need not be members of the Board.

Each of such officers shall hold office for one (1) year from November first to November first and until his successor shall be elected and shall assume his office.

In case of the death, resignation, removal or refusal to serve of any officer, the Trustees shall have power to fill the vacancy so created.

Section 2. The President shall preside at all meetings of the corporation or Trustees and shall, from time to time, bring to their attention such subjects as in his opinion require action or are worthy of consideration. He shall execute all contracts and instruments on behalf of the corporation.

Section 3. In case of death, absence, resignation or disability of the President, the senior Vice-President in point of service shall perform the duties of the President.

Section 4. The Secretary shall have charge of the books, records and archives of the Society, except such as are specifically placed in the control of any other officer; he shall cause notices to be issued of all meetings of the corporation, of the Trustees and of the executive committee, and shall keep a record of the proceedings of all such meetings. He shall sign all contracts and other instruments on behalf of the corporation; he shall have the custody of the seal of the Society and affix the same when authorized so to do by the President, by the Executive Committee or by the finance committee, and shall perform such other duties as usually pertain to his office.

Section 5. The Treasurer shall receive and disburse the funds of the corporation under the direction of the Trustees or of the Executive Committee; he shall keep a true and accurate account of the finances of the corporation in books belonging to it, which shall be in his custody and shall at all times be open to the inspection of the Trustees; he shall report the financial condition of the corporation quarterly, and shall perform such other duties as usually pertain to his office.

Section 6. Any Benefactor of the Society whose gifts or services merit the distinction, may be elected by the Trustees an Honorary President for life.

Section 7. The Trustees may provide for the election or appointment of such other officers as may from time to time be deemed advisable.

ARTICLE II

TRUSTEES

Section 1. If any trustee shall be absent from three (3) consecutive regular meetings, unless such absence be due to sickness, absence from the county, or other reason which shall be declared a sufficient excuse by the Board of Trustees, by a resolution entered in its records, he shall be considered as having resigned his office and the Secretary shall notify the Trustees thereof.

Section 2. In case of any vacancy in the Board of Trustees, by death, resignation, or failure to attend the meetings, the remaining Trustees shall have power to fill the same, by an election at any regular or special meeting, for the unexpired term; but no such election shall be made except from nominations in writing filed with the Secretary at least ten (10) days prior to the meeting at which the election occurs.

ARTICLE III

MEETINGS

Section 1. The annual meeting of the Society shall be held on the second Wednesday in October, or upon any date thereafter to which said annual meeting may be adjourned. At such meeting a report shall be presented by the Trustees of their transactions during the preceding year and of the general condition of the Society, and of any other matters that may prove of interest to the governing members.

Section 2. Special meetings of the Society may be called at any time by the Secretary upon five (5) days' written notice to the governing members, upon an order of the President or of the executive committee, or upon the written request of ten (10) members.

Section 3. At all meetings of the Society thirteen (13) members shall constitute a quorum.

Section 4. Regular quarterly meetings of the Trustees shall be held on the second Monday of December, March, June and September in each year and may be adjourned from time to time as the Trustees shall determine.

Section 5. Special meetings of the Trustees may be called at any time by the Secretary, upon

twenty-four (24) hours' written notice, upon the order of the President or of the executive committee, or the written request of three (3) members of the Board.

Section 6. At all meetings of the Board of Trustees, five (5) members shall constitute a quorum.

ARTICLE IV

STANDING COMMITTEES

Section 1. There shall be five (5) standing committees of the Society, as follows:

1. A Finance Committee to consist of three (3) members of the Board of Trustees and the Treasurer of the Society *ex officio,* of which committee one of the Vice-Presidents shall be chairman. The Finance Committee shall have charge of the moneys and securities of the Society and of their investment and reinvestment, and shall make recommendations to the Boards of Trustees from time to time concerning the financial interests of the Society.

2. An Executive Committee to consist of five (5) members of the Society, of which committee one of the Vice-Presidents shall be chairman. This committee shall have general charge of the

affairs of the corporation when the Board is not in session, and shall have immediate charge, control and regulation of the Institute when completed and in operation.

3. An Auditing Committee to consist of three (3) members of the Board of Trustees, none of whom shall belong to the Executive or Finance Committee. It shall be the duty of the Auditing Committee to examine the Treasurer's books and vouchers quarterly, and to audit his accounts before they are presented to the Trustees, and also to examine and certify his annual statement before it is presented to the Society; it shall also, at least annually, and oftener if deemed necessary, examine the securities of the permanent funds of the Society and report thereon to the Trustees, employing for any of the foregoing reports such professional accountants or assistance as may be deemed necessary.

4. A Committee on Acquisitions to consist of five (5) members, one or more of whom may, in the discretion of the Board of Trustees, be expert, and may be non-resident in the city of Minneapolis or State of Minnesota. One of the Vice-Presidents shall be chairman of this committee. All objects of art proposed to be given to, or purchased by, the Society, shall be submitted to, and examined by, this committee, and no object

shall be purchased or accepted on behalf of the Society unless it shall be approved by at least four members of the committee, or approved by an expert specifically authorized by the Board.

5. A School Committee to consist of not less than five (5) nor more than nine (9) members, of whom two (2) at least shall be Trustees and the others may be selected from members of the Society outside of the Board. It shall be the duty of this committee to supervise and direct the conduct of the School of Art maintained by the Society and to recommend to the Board of Trustees from time to time the appropriations for the support of the school and the persons to be employed as directors or teachers therein.

Section 2. An Exhibition Committee to consist of five (5) members, of which the chairman shall be a member of the Board of Trustees, may, in the discretion of the Board, and upon its resolution, be appointed. This committee, if constituted at any time, shall assist the director or acting director of the Institute, as he may desire, in planning for, and arranging exhibits, or in arranging courses of lectures or other entertainments to be given under the auspices of the Society.

Section 3. Each of the foregoing committees shall report to the Board of Trustees whenever

requested so to do and may report at any meeting of the Trustees, regular or special.

Section 4. No committee of the Board of Trustees, or any officer or agent of the Society, shall incur any expense, liability or indebtedness for the Society except in pursuance of prior appropriations therefor, or of a vote of the Board of Trustees, at a regular or special meeting.

Section 5. All committees shall be appointed by the President as soon after the first day of November in each year as convenient and committees so appointed shall continue in office until their successors shall be named and shall assume their duties. All vacancies occurring in the committees shall be filled by the President, for the unexpired term.

Section 6. The Trustees may provide for the appointment of such other committees as may, from time to time, be deemed advisable.

Section 7. The President shall be, *ex officio*, a member of every standing committee.

Article V

ANNUAL MEMBERS

There is hereby constituted a class to be known as Annual Members. Any person who shall contribute to the Society the sum of ten dollars

($10), may become an annual member and shall, with members of his or her family and non-resident guests, be entitled at all times to free admission to all lectures and other entertainments given by the Society, to all temporary exhibitions held under the auspices of the Society, and to all permanent exhibitions of the Society in the rooms or buildings occupied by it from time to time.

The dues of annual members shall become payable on the first day of November in each year, and the name of any annual member whose dues shall not be paid by the first day of January next following, shall be stricken from the rolls and the membership rights shall be withdrawn.

Article VI

Certificates of Membership

The Trustees shall cause to be provided suitable certificates of membership for the various classes of members of the Society. One of such certificates, signed by the President and countersigned by the Secretary, shall be delivered to each member of the Society, according to his class.

NOTES

The custom of beginning the fiscal and business year on October first, which comes about from the fact that the school year begins at that time, is often impracticable. Whatever the date chosen, some branch of a large work will be inconvenienced thereby, but the beginning of the calendar year is usually preferable to any other time, on account of the system of numbering accessions which is in use in most museums.

Memberships should begin whenever the money is paid and expire at the end of the period paid for, otherwise a member who might join March 1st will wait till November and the Society will lose six months' use of the money.

Where an accessions committee is given absolute power, as here, the director is saved much responsibility and odium in accepting or rejecting works of art. At the same time, if the director is a competent person, the committee may vote him sums of money to be spent at his discretion whenever occasion arises, as on a trip to Europe or New York.

MUSEUMS VISITED

ENGLAND

The dates are of the last visit.

Liverpool, 1913	Walker Art Gallery
	Free Public Library and Museum
London, 1913	British Museum
	British Museum New Wing
	National Gallery
	Victoria and Albert
	National Portrait Gallery
	Tate Gallery
	Wallace Collection
	Burlington House
Oxford, 1913	Ashmolean Museum

FRANCE

Chantilly, 1908	Chateau
Orleans, 1908	Musée
Paris, 1914	Louvre
1914	Luxembourg
1914	Trocadero
1913	Gobelins
1914	Cluny

FRANCE—*Continued*

Paris, 1914.....Petit Palais
1908.....Musée d'Artillerie et de l'Armée
1914.....Musée des Arts Decoratifs
1914.....Musée Jacquemart-André
1914.....Sèvres
1913.....Musée Carnavalet
1913.....Guimet
1908.....Maison Victor Hugo
1914.....St. Germain en Laye
1914.....Maisons Lafitte
Rouen, 1908.....Musée bibliothèque
Tours, 1908.....Musée
Versailles, 1913.....Musée National

GERMANY

Aix la Chapelle, 1911.....Suermondt Museum
Berlin, 1914.....Kaiser Friedrich Museum
1912.....Zeug Haus
1914.....Kunstgewerbe Museum
1912.....Ethnographical
1912.....Museum of Costumes
1912.....Märkisches
1914.....Altes Museum
1914.....Neues Museum
1912.....Hohenzollern
1914.....National Gallerie

GERMANY—*Continued*

Darmstadt, 1912	Art Museum
	Kunstgewerbe
Dresden, 1912	Gemälde Gallerie
	Zoological and Ethnographical Museum
	Historical Museum
	Grüne Gewölbe
	Albertinum
Frankfurt a/M, 1912	Liebig Haus
	Städel
	Kunstgewerbe
	Kunstverein
	Historical
	Goethehaus
Hamburg, 1914	Kunsthalle
	Ethnographical
	Kunstgewerbe
	Historical
Leipzig, 1912	Kunstgewerbe
	Kunsthalle
Munich, 1914	Neue Pinakothek
1914	Alte Pinakothek
1912	Schack Gallerie
1914	Glas Palast
1912	Glyptothek
1914	National Museum

GERMANY—*Continued*

Munich, 1914.....Deutsches Museum
1912.....Museum of Casts
Nuremberg, 1914.....National Museum
Weimar, 1912.....Kunstmuseum
Goethehaus

ITALY

Aquila, 1912.....Palazzo Dragonetti
Palazzo Persichetti
Arezzo, 1914.....Museum
Bari, 1912.....Provincial Museum
Bergamo, 1912.....Accademia Carrara
Bologna, 1912.....Pinacoteca Accademia di Belle Arti
Museo Civico
Museo di San Petronio
Brescia, 1912.....Roman Museum
Mediaeval Museum
Martinenghi Collection
Ferrara, 1912.....Pinacoteca del Ateneo
Museo Palazzo Schifanoia
Florence, 1913.....Archæological Museum
Galleria degli Arazzi
Casa Buonarotti
Galleria Antica e Moderna
Galleria Corsini

ITALY—*Continued*

Florence, 1913	Galleria Pitti
	Galleria degli Uffizi
	Museo di San Marco
	Museo di Sta. Maria del Fiore
	Museo Nazionale
	Palazzo Vecchio
Lecce Pugliese, 1912	Museo Municipale
Mantua, 1912	Archæological Museum
Milan, 1912	Brera
	Ambrosiana
	Poldi Pezzoli
	Sforzesco
	Museo Borromeo
Naples, 1912	National Museum
	San Martino
Padua, 1912	Museo Antoniana
	Museo Civico
Parma, 1912	Museo Reale d'Antichità
	Reale Galleria
	Accademia di Belle Arti
Perugia, 1914	Pinacoteca Vannucci
Pesaro, 1914	Museo Oliveriano
Piacenza, 1912	Museo Civico
Pisa, 1912	Museo Civico
Ravenna, 1912	Pinacoteca
Rimini, 1914	Picture Gallery

ITALY—*Continued*

Rome, 1914	Vatican Picture Gallery, Sculpture Gallery, Egyptian Gallery
	Conservatori
	Campidoglio
	Terme
	Casino Borghese
	Corsini Gallery
	Galleria d'Arte Moderna
	Museo Artistico Industriale
	Accademia di San Luca
	Barberini Gallery
	Rospigliosi-Pallavicini
	Museo Barracco
	Colonna Gallery
	Doria-Pamphili Gallery
	Spada Gallery
	Museo Kircheriano
	Lateran
	Villa Papa Giulio
	Villa Albani
San Sepolcro, 1914	Picture Gallery
Siena, 1912	Cathedral Museum
	Accademia di Belle Arti
Sulmona, 1912	Museo Civico
Taranto, 1912	Museum
Turin, 1913	Accademia delle Scienze

ITALY—*Continued*

Turin, 1913.....Armeria Reale
Museo Civico
Urbino, 1914.....Palazzo Ducale
Verona, 1912.....Museo Civico
Venice, 1914.....Museo Correr
Galleria d'Arte Moderna
Accademia
Museo del Palazzo Ducale
Vicenza, 1912.....Museo
Viterbo, 1912.....Museo Municipale

DENMARK

Copenhagen, 1914.....Danish Folks Museum
Art Museum
Glyptothek
Industrial Art Museum
National Museum
Thorvaldsen Museum

SWEDEN

Stockholm, 1914.....National Museum
Northern Museum
Skansen
Malmö, 1914.....Baltic Exposition, 1914

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